CALIFORNIA
OIL WORLD
and Petroleum Industry

NO. 11 OF A SERIES SHOWING HOW SECURALOY INCREASES DEVELOPMENT EFFICIENCY

The SECURITY Piloted Drilling Bit

FOR SUBSURFACE REMOVAL OF SECURALOY PIPE & ACCESSORIES

● Thousands of feet of SECURALOY pipe and accessories have been removed from hundreds of wells with the Security Piloted Bit. SECURALOY is a metal which is best cut with the shearing action of a blade type bit. The important points that influence the drilling of SECURALOY follow:

BIT DESIGN • A piloted bit of the blade tooth type is recommended for removing SECURALOY. The pilot stabilizes the bit and its cutting edges should be sufficiently sharp to cut through cement or formation bridges within the pipe. The main cutting blades should have a rake of approximately 20 degrees and a clearance angle of about 10 degrees. The diameter of these blades is controlled, of course, by the size of the casing through which the bit is run, while the diameter of the pilot blade is within ¼" of the inside measurement of the SECURALOY pipe being removed.

WATER COURSE • Adequate circulation should be provided with sufficient velocity to carry the cuttings away from the bit, and it is advantageous to circulate freely for a few minutes before each new drill pipe connection is made.

DRILLING SPEEDS AND WEIGHT • Rotary table speeds of from 75 to 125 r.p.m. with from ¾ to 1½ points of weight on the bit give best cutting efficiency when drilling SECURALOY.

CHIP REMOVAL • For quick removal mud viscosities of more than 30 are best suited, but lesser viscosities will not prove a hindrance. The chips should be segregated from the circulating fluid when they reach the surface to prevent them from recirculating down the drill pipe.

● **THE SECURITY PILOTED DRILLING BIT** has been engineered from top to bottom for the specific job of drilling SECURALOY. It incorporates all the correct design features and is available in a wide range of sizes. More complete information will be sent upon request.

These SECURALOY chips are approximately actual size and were screened from the circulating fluid of a drilling well.

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Dependability

H.C.SMITH

DRILLING TOOL

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1. Triple bearing construction of the gauge cutters eliminates side play of cutters and insures full gauge of hole.

2. Rugged body and superior design cross cutter bearing construction permits high rotational speed and heavy loads—when desirable.

3. Cutter assemblies designed to utilize the maximum cutting surfaces of all individual cutters.

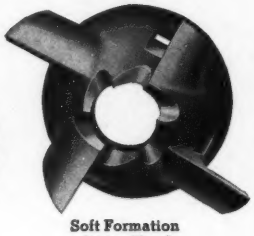
4. More circulation provided through large slush tubes on side cutter and fan-tail circulation along cross cutters prevents "balling" of bit. Large openings around cutters permits quicker displacement of cuttings from bottom of hole.

5. H. C. Smith Rock Bits cut straight holes because the concave construction of the cross cutters allows a cone to form in the center of the hole which acts as a centering guide for the bit.

Foreign Operators: DULL CUTTERS ON H. C. SMITH ROCK BITS CAN NOW BE REPLACED WITH NEW CUTTER ASSEMBLIES IN YOUR OWN SHOPS AT A SUBSTANTIAL SAVING

WRITE FOR DETAILED INFORMATION

Hard Formation Cutter Head



Soft Formation Cutter Head

H. C. Smith T-39 Wire Line Core Drill

FEATURES OF THE H. C. SMITH T-39 WIRE LINE CORE DRILL

1. Simple and positive locking of inner barrel while coring and retrieving of barrel after coring operation is completed.

2. Improved bearings in cutters which allows longer hours on bottom without loss of hole gauge.

3. Heavier pins and body construction for increased safety.

4. Improved double core catcher.

5. Floating inner barrel.

6. Hard and soft formation cutter heads are interchangeable on core drill.

H C Smith Oil Tool Co.

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CALIFORNIA
OIL WORLD
and Petroleum Industry

THE AUTHORITY ON THE CALIFORNIA OIL INDUSTRY

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November 9, 1939

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Timely Petroleum Topics Boost Attendance

at A. I. M. E. Fall Meeting in L. A.

Promise of an outstanding selection of timely papers by authoritative speakers brought out a record attendance at the Fall Meeting of the American Institute of Mining and Metallurgical Engineers, Petroleum Division, October 19-20, at the Biltmore Hotel, Los Angeles. Among notables of the Institute present were Donald B. Gillies, national president of A.I.M.E., who is vice president of Republic Steel Co.; A. B. Parsons, secretary of A.I.M.E.; W. H. Geis, national chairman of the Petroleum Division, of Union Oil Co.; E. J. Kennedy, Jr., assistant to the A.I.M.E. secretary; Chester Naramore, secretary of the Petroleum Division, and E. DeGolyer, past national president of A.I.M.E.

Speakers and meeting chairmen were: R. P. McLaughlin, R. W. French, Jr., John C. Young, Ernest K. Parks, Stanley Herold, Dan R. Rankin, H. T. Wyatt, John E. Sherborne, Harry Stolz, Eldon N. Dunlap, F. G. Taves, G. F. Olsen, Mortimer Kline, Read Winterburn, Gail Larkin, Martin Van Couvering, Eugene B. Waggoner, R. E. Allen, Thomas A. Atkinson, Floyd Merritt, Carlton Beal, Jay B. Wharton, Walter Clute, Allan H. Hand, E. DeGolyer, F. E. Vaughan, V. H. Wilhelm, W. S. Eggleston, Joseph Jensen, Admiral H. A. Stuart, B. H. Sage, W. N. Lacey, W. M. Morris, R. H. Burnett, A. J. Carlson, Max Eastman, Ben E. Gumpertz, G. A. Joslin, and Donald B. Gillies.

Whether they need it or not, the old-timers in the A.I.M.E. have a constant fire sparkplug, the Junior Members. As pointed out by one of the organizers, Carlton Beal, of the Coast District, one of the outstanding features of the Southern California Section of the A.I.M.E. during 1939 has been the unusual success of the Junior Members of the Institute in the Los Angeles District. Junior Members affiliated with the Institute cannot be more than 33 years of age and are qualified by education or experience to hold subordinate positions in engineering, mining, geological, or chemical work. The new organization of the younger members is of utmost importance because there are few similar organizations in the country. The Junior Members at their meetings have placed particular emphasis on the development of the professional, engineering, and technological interest in their members through round table discussions.

"During the early part of 1938," said Mr. Beal, "Chairman E. K. Parks, of the Southern California Section of A.I.M.E., proposed that the Junior Members organize their own meetings. Of the group of 60 Junior Members, it was noted that only a small percentage actually contributed to or attended the meetings of the regular members. This lack of interest was partly caused by the varied interests of the two groups and the desire of the Junior Members to take a more active part in the programs rather than merely to listen to topical speakers. The response to Chairman Parks' proposal was unanimous. At their first meeting in March 1938, all favored the proposed organization. Since that time the Juniors have held 18 meetings, one each month, all of which are summarized in the accompanying tables."

Summarizing his discussion of "The Technical Problems of Subsurface Operations in the Development and Production of Petroleum," Ernest K. Parks, Consultant, said: "In order to review

Joseph Jensen

W. H. Geis

R. E. Allen

TABLE I
SUMMARY OF MEETINGS, JUNIOR MEMBERS A.I.M.E. SOUTHERN CALIFORNIA SECTION
MARCH 1938 to SEPTEMBER 1939

Date of Meeting	Subject	Speaker	Attendance
3/29/38	"Pioneering for Oil in Alaska"	Carlton Beal*	36
5/17/38	"Aerial Mapping"	W. Couzzens	13
6/ 9/38	"Application of Geophysics to Mining and Petroleum Industries"	Dr. F. Vaughn*	22
7/ 7/38	"Core Analysis"	John B. Sherbornne*	34
8/ 4/38	"Mud Control of Drilling Wells"	Lee Heubel*	26
9/ 1/38	"Subsurface Pressure Measurements"	Ed Babson*	24
10/ 6/38	"Some Problems in Pumping Wells"	Carl Dawson*	28
11/ 3/38	"Electrical Logging of Open Holes"	Warren Woodruff*	25
12/ 1/38	"Relationship of Cement Testing to Oil Well Cementing"	F. E. Davie	21
1/12/39	"Oil Well Cementing"	L. E. Harrington	36
2/ 2/39	"Gravel Packing"	E. Wagner and Don Smith*	31
3/ 2/39	"The Use of Dynagraph Cards in the Study of Pumping Wells"	E. V. Watts	28
4/ 6/39	"Estimation of Underground Reserves"	E. G. Trostel*	50
5/ 4/39	"Multizone Production and Completion Methods"	L. B. Riggins, Jr.*	16
6/ 1/39	"Information Please!" Free for all questions	R. W. French*	25
7/ 6/39	"Factors Controlling Oil Production" and "Deep Well Drilling Practice and Equipment"	Free for all discussion	18
8/ 3/39	"Drilling Needs and Drilling Costs"	Lee Heubel*, D. Hewton, T. Atkinson*	31
9/ 7/39	"Functions and Operations of the California Oil Umpire"	J. R. Pemberton*	36
		TOTAL	500

*—Member A.I.M.E.

TABLE II
SPEAKERS, ATTENDANCE, MEMBERSHIP

SPEAKERS AND ATTENDANCE

	Number Speakers and Percent		Attendance and Percent		Average Attendance Per Speaker
A.I.M.E. Members	13	72.2%	384	76.8%	29.5
Outsiders	4	22.2	98	19.6	24.5
Free for all	1	5.6	18	3.6	18.0
TOTAL	18	100.0%	500	100.0%	27.7

MEMBERSHIP

End of Year	Enrollment	Increase Over Preceding Year
1936	51	.....
1937	60	17.6%
1938	87	45.0%
1939	127*	46.9%

*Estimated on basis of first 9 months.

current problems for those who are not experienced in the technique but who are interested in contributing to progress in the drilling and production of oil wells, the author describes the general case of the discovery of an oil field and the routine development which follows. The elementary practices of drilling disclose that to reach a greater depth is and has been the greatest urge to improvement, but it is pointed out that there is still ample opportunity to reduce costs. Drilling is stated to be a metallurgical and mechanical problem, complicated by difficulties of measuring details of performance of various items. Production is concluded to be the major problem, wherein the fluid mechanics of the reservoir offer a great field for further investigation."

Discussing the various items of subsurface equipment, Mr. Parks said, "Bit design is complicated by limited area of the cross section, by necessity for providing circulation orifices and by lubrication difficulty. Those who would improve our bits are warned that the field is crowded, and that substantial further improvement in rate formation cutting may involve some change in the present practice of merely rotating a cutting device with more or less weight applied thereto.

"The mud-laden fluid performs four important functions which are: (1) to cool and lubricate the bit; (2) to remove the cuttings from the bit itself, from the bottom of the hole to the surface; (3) to maintain the side-walls of the drilled hole, and (4) to overcome the native fluid pressure of the penetrated formations. Each of these functions has a multitude of subsidiary details, many of which are in themselves worthy of extended treatment. . . . The importance of the mud laden fluid, although realized by a few pioneers many years ago has only recently been acknowledged in practice to the extent that specialists now devote their entire time to field operations, and mud control is regarded as the prime factor in drilling. There has been phenomenal progress, but the physical-chemist will still find the subject worthy of attention.

"Another essential material in casing the well is cement, and although the correct properties to insure pumpability, delayed initial setting time, quick setting when in place and competent tensile strength, have not been achieved without much effort, it is not likely that the increased time involved in placing cement in the deep wells and the higher temperatures which are encountered will offer a really serious obstacle. Not only the quality of the cement, but the skill and equipment of those who specialize in that work is to be commended."

On the subject of production, Mr. Parks said, "Problems of production arise principally from two fundamental limits, that is, the economics and depth of the well. Economics are currently affected by a condition of over-production wherein maximum rates are dictated

Ernest K. Parks

by law or by voluntary practice, and it is not the purpose of this paper to analyze the effect of such restrictions upon operations. The factor of depth, however, is one which confronts producers

R. W. French Jr.

and has already led to development of specialized machinery which at least indicated the problem may be handled to whatever depth that it is now possible to drill a well. Fortunately it so happens that the deeper the well the greater is the native pressure of the sub-surface reservoir. Fortunately also the reser-

voir usually contains gas in sufficient proportions to lift a substantial quantity of oil to surface under conditions of natural flow. When this ceases, the pressure is still sufficient to allow the gas-lift to be applied which makes the principal problem that of recovering the oil which is not productive by these two

V. H. Wilhelm

devices. Natural flow presents the least of the problems, but this should not be understood as indicating the operation of an oil field under natural flow does not warrant the very best of engineering supervision. In the case of gas-lift, much additional equipment is required and engineering supervision must be increased but the problems although complex are not particularly formidable. When the reservoir pressure has declined to a value which makes the gas-lift operation uneconomical or impossible, some method must be found which will reduce the subsurface oil pressure opposite the producing horizon sufficiently to allow commercial rates of entry into the well. This may be accomplished by the use of special appliances which may consist of a pump or a two-stage device composed of a pump and a gas-lift or some intermittent device which, through a series of valves applies pressure to the lifting system in such manner that the back pressure against the formation is kept at some predetermined minimum.

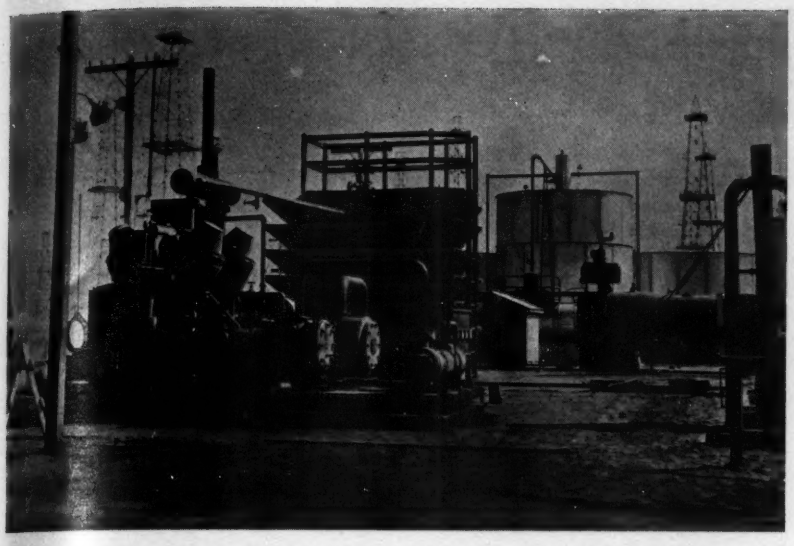
H. T. Wyatt

"Far more important than the mere lifting of the oil, once it comes into the well is the problem of draining the reservoir to increase the proportion of the original quantity of oil which may be extracted. Factors which now limit this proportion are: (1) reckless waste of natural energy; (2) damages arising from improper development and poorly planned production policy; (3) gradual deterioration of capacity of a well to drain the reservoir in the vicinity of the bore hole; (4) the decline of the rate of production to a non-commercial rate."

A. B. Parsons

Harold T. Wyatt, of Shell Oil Co.,

On Wheeler Ridge deep formations have baffled engineers. On the plains beyond, heavy equipment is plumbing the depths.



Compressor plant construction at Richfield's Long Beach field operation.

Inc., in his discussion of "Optimum Rate of Production of Oil," outlining technical considerations said, "Dependent on physical properties of the reservoir rocks and the fluids contained in their pore spaces, oil fields can be classified as producing under: a) **Water drive conditions** if the larger portion of the oil produced is being replaced by encroaching edge water. b) **Depletion conditions** if the main driving force of the oil is supplied by the expansion of gas originally in solution in the oil. c) **The condition of an expanding gas cap** if a portion of the pore space was originally filled with free gas which expands during the productive life of the field, driving the oil towards the wells.

"Practice has shown that in all three classes the rate at which oil is withdrawn from the reservoir definitely influences ultimate recovery. Where a water drive prevails the extent to which oil is replaced by water depends of course on the texture of the reservoir rock and the physical properties of the oil and the water. More important, and perhaps less generally appreciated, are the findings obtained from laboratory core analysis indicating that the extent to which oil is replaced by water is also a function of the rate of water advance.

"In many water drive fields the conditions are such that edge water has a tendency to wedge into the oil body, resulting in the well-known phenomena of tonguing and coning of edge water, particularly in down-structure locations. These tongues may lead to early abandonment of the wells. Practice has shown that the productive life may be extended considerably by careful adjustment of the rate of production of such edge wells.

"When a field is producing under depletion conditions, i.e., the main driving force of the oil is supplied by the expansion of gas originally in solution in the oil, the wells generally show a gradual increase in gas oil ratio accompanied by a decline in the closed-in bottom hole pressure. Again, dependent on subsurface conditions, these phenomena may be influenced favorably by adjusting the rate of withdrawal, thereby increasing the ultimate recovery from the reservoir. Rules with general application for the relationship between ultimate recovery and rate of production have not yet been developed, therefore, it is necessary to consider each field on its own merits.

"The distribution of reservoir pressures throughout the entire field is an important factor influencing recovery from depletion fields. The withdrawal of large quantities of oil from small areas in such fields, while other areas are drained slowly or not developed at all, has been found to be poor practice and best recoveries can be expected when oil withdrawals are distributed throughout in such a manner that reservoir pressures are uniformly maintained at all times. To ascertain correct withdrawal rates and attain this condition requires giving constant consideration to the volume and contents of that portion of the reservoir drained by each well.

"Should the reservoir originally have had a **gas cap** condition, the rate of withdrawal from each well must be adjusted very carefully in order to prevent wastage of valuable energy since in such reservoirs the gas cap will gradually start expanding when wells are brought in and simultaneously depletion zones may be formed around each of the wells with part of the pore space filling with free gas. Especially in the wells situated higher up-structure, the chances are great that these gas-filled pore spaces will become connected with the gas cap, resulting in an early blowing through. In many cases it is possible, through adjusting the rate of production, to obtain higher cumulative recovery before the wells require closing in. The foregoing review is general in scope and is only intended to bring forth the salient points which may be summarized as follows:

"1) With a given spacing the volumetric recovery from a reservoir can be favorably influenced through careful adjustment of the rate of production of each well. 2) Any selection of production rates based on the potential daily oil capacity of the wells without due consideration to utilization of reservoir energy, both gas and water, and without regard to the undesirability of high withdrawals from small areas, may well lead to low recoveries. 3) Irregular development may result in high withdrawals from small areas and consequently in reduced recovery from the entire reservoir."

"Geophysical Studies in California," the topic of a paper by F. E. Vaughan, Consultant, was introduced by the speaker thus: "One of the greatest steps in the advancement of the geological sciences made during the past century is the development of physical methods for field studies. For more than sixteen years rather extensive surveys have been made in connection with the search for oil and other mineral accumulations. Several methods have been employed in California and it is the purpose of this paper to show in a general way the progress of geophysical studies in this state.

"Since geophysical surveys are rather expensive, special emphasis is usually placed upon their usefulness in directly determining local structures of economic value. However, they are fully as important in throwing light upon many of the more fundamental problems of tectonic geology, indeed they promise to afford definite solutions of some problems heretofore held to be entirely of a speculative character. The importance of this phase of geophysical work should be stressed since proper theoretical considerations are of great value to the economic geologist in helping him gain and retain a clear picture of the structural relationships throughout a large district and enabling him to focus more effectively his attention upon certain restricted portions of the district."

Discussing the Eotvos torsion balance, the speaker said considerable difficulty was experienced in attempting to determine local structures of economic value by means of the torsion balance. Local

(Continued on Page 12)

C. N. G. A. Fall All-Day Technical Meeting

Is Seminar of Industry Nov. 14

That the 14th Annual Fall All-Day Technical Meeting of the California Natural Gasoline Association to be held

B. H. Sage

Nov. 17 at the Ambassador Hotel, Los Angeles, will virtually be a natural gasoline and natural gas seminar is the word passed out by P. S. Magruder, president of the association.

Pointing out that every attempt has been made to make this year's meeting one of the most finely balanced in the association's history, Mr. Magruder particularly requested that every association member appoint himself a committee of one and contact some friend in the petroleum, natural gas and liquefied gas industries for the purpose of inviting them to attend with the membership, as the papers to be presented will be of equal and great interest to them.

In addition, Mr. Magruder made the suggestion that every one planning to

J. S. Gallagher

attend should so arrange his affairs that he can attend for the full day. The morning session is of such worth that members can well afford to close up shop for the day, the knowledge gained from the fine papers more than compensating for the time away from the office. In this connection it is suggested that members come direct to the hotel without going to their offices as, from the first event on the program—Registration, which begins at 8:00 a.m.—the morning session is pack jammed with papers of exceptional value.

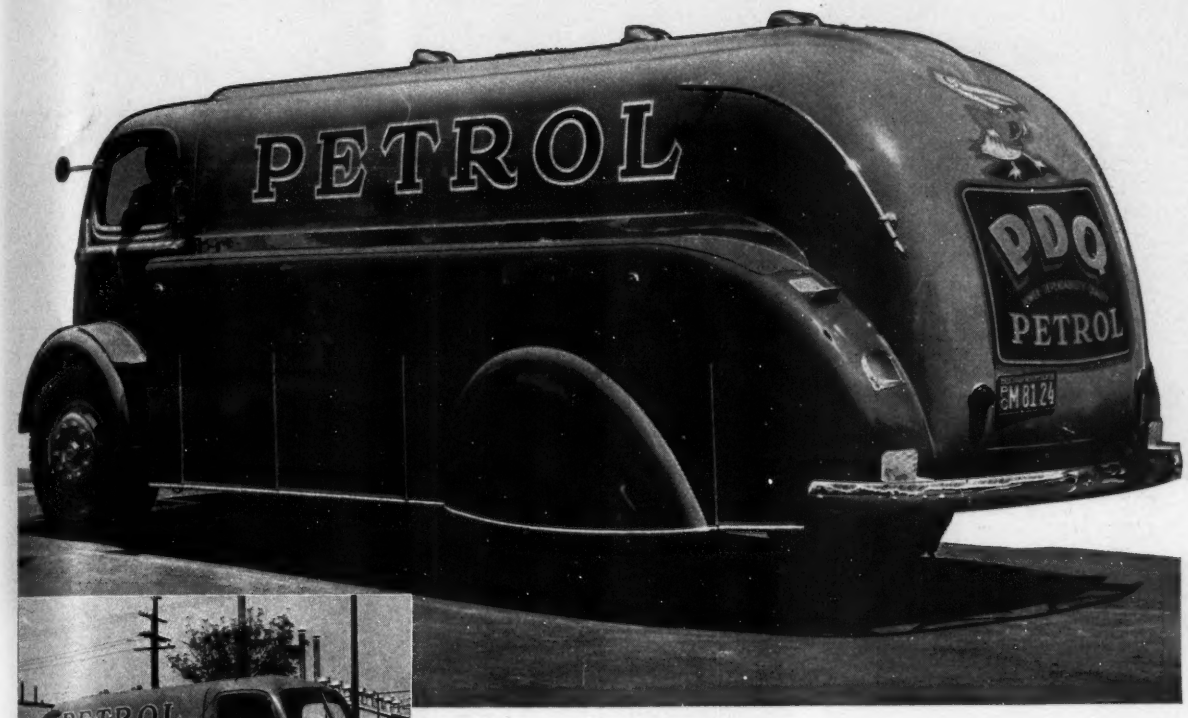
W. J. Podbielniak

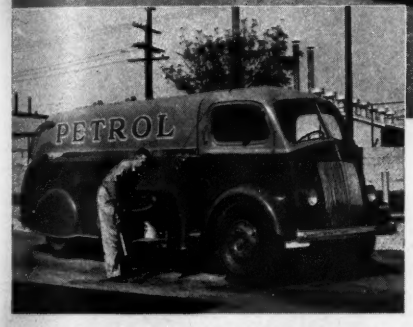
The program for the day is as follows: Morning Session; Registration, 8:00-9:30

Roy M. Bauer

Left, A. L. Blount; right, K. Korpi, of Union Oil Research Department.

Any way you look at it...





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The big swing to White Super Power continues! This Petrol Corporation White operating in Los Angeles is typical of the trend. Its light chassis weight assures more payload per trip. White's Super Power design results in trip-time savings of hours with no increase in top speeds. And its fuel economy verifies White's claim of at least a mile more per gallon on identical trips with identical loads.

THE WHITE MOTOR COMPANY

BRANCHES LOCATED IN: **Los Angeles, San Francisco, Sacramento, Seattle, Portland and Spokane . . .** *DEALERS* **are located in all the important cities.**

Wherever you see the new White Super Power insignia on the side of a hood, you are looking at a truck capable of earning $1200 extra every year.

White TRUCKS

WHITE TRUCKS ARE PRICED AS LOW AS $950 PLUS TAX (BASE PRICE AT CLEVELAND PLANT)

Doug Balthis

P. S. Magruder

Gus Wetzel

Walter Dayhuff

E. W. Gard

George Tyler

a.m.; "President's Address," P. S. Magruder; "Report of the Technical Committee," W. W. Robinson, Jr.; "C.N.G.A. Liquefied Gas Standards," J. S. Gallagher; "Advances in Analytical Fractionation Technique," W. J. Podbielniak; "Natural Gas Conservation and Utilization in California," Roy M. Bauer; Adjournment for luncheon, 12:00 noon.

Afternoon Session, 2:00 p.m.; "Alkylation," E. W. Gard, Arthur Blount, Dr. K. Korpi; "The Role of Natural Gasoline Plant Products in Motor Fuels of the Future," C. C. Moore; "The Centrifugal Super-Contactor," W. J. Podbielniak; Adjournment. Evening Session, 7:00 p.m., Annual Association Banquet and Stag Show.

Chairmaned by W. C. Dayhuff, the Fall Meeting Committee has worked for many months preparing for the event. The committee consists of B. D. Balthis, George Christen, C. D. Gard, John H. Kunkel, P. S. Magruder, W. W. Robinson, Jr., Lyman Scheel and George Tyler.

The evening session will be the high spot of the association's yearly entertainment events with a whole series of radio and Orpheum vaudeville headline acts scheduled to provide merriment for the occasion. The entertainment committee is under chairmanship of Harry Fiske with the committee members being C. B. Bascon, George Christen, Gordon Greene, F. H. Weaver, J. V. Welsh, Henry Schumacher, J. J. Delaney and A. E. Wetzel.

An automobile gadget that whistles when the gasoline tank is being filled and stops whistling just before the fuel reaches the overflowing point may be standard equipment on one or more of the new 1940 car models.

PRODUCTION :-: DEVELOPMENT

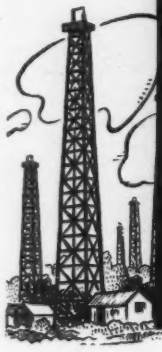
(Figures of Production and Stocks are in barrels of 42 Gals.)

	Total Production September	—DAILY AVERAGE— Sept., 1939	Aug., 1939	Sept., 1938
Group No. 1				
Arvin	64,897	2,163	1,733	.....
Belridge—North	354,471	11,816	12,200	12,553
Belridge—South	34,018	1,134	1,240	1,119
Canal	169,768	5,659	5,729	2,854
Canfield Ranch	2,410	80	90	98
Coalinga	614,573	20,486	20,284	10,940
Cole's Levee	52,167	1,739	1,194	.....
Edison	63,994	2,133	2,207	2,555
Elk Hills	310,487	10,350	10,447	10,411
Fruitvale	189,130	6,304	6,203	7,743
Greeley	68,929	2,298	2,275	3,000
Kern River	358,758	11,958	11,764	12,031
Kettleman Middle Dome	849	28	26	40
Kettleman North Dome	1,567,893	52,263	52,219	63,468
Lost Hills	107,172	3,572	3,411	3,482
McKittrick	111,220	3,707	3,793	3,362
Midway-Sunset	1,471,169	49,039	49,724	57,331
Mountain View	237,452	7,915	8,101	9,695
Mount Poso	329,271	10,976	10,674	14,811
Paloma	4,975	166	8	.....
Rio Bravo	229,758	7,659	7,835	8,152
Round Mountain	255,269	8,509	8,569	13,516
Strand	19,699	657	340	.....
Ten Section	271,433	9,048	9,398	8,218
Tupman	17,499	583	499	.....
Wasco	45,786	1,526	1,355	377
Wheeler Ridge	9,906	330	323	310
Group No. 2				
Capitan	66,907	2,230	2,339	2,897
Elwood	123,585	4,120	4,155	5,236
Rincon	104,604	3,487	2,630	3,515
San Miguelito	86,153	2,872	2,779	2,295
Santa Barbara	8,223	274	268	380
Santa Maria	558,077	18,602	16,315	19,580
Summerland	651	22	27	32
Ventura Avenue	1,048,706	34,957	35,579	34,237
Ventura-Newhall	206,312	6,877	7,034	5,313
Watsonville	900	30	30	30
Group No. 3				
Brea-Olinda	171,652	5,722	5,725	5,598
Coyote—East	78,767	2,626	2,665	3,289
Coyote—West	279,332	9,311	9,133	8,105
Domingues	544,490	18,150	18,868	25,059
El Segundo	87,372	2,912	2,980	6,499
Huntington Beach	786,881	26,229	25,475	31,208
Inglewood	372,820	12,427	12,566	13,752
Lawndale	1,001	33	45	64
Long Beach	1,349,266	44,976	45,215	55,964
Los Angeles-Salt Lake	16,236	541	572	570
Montebello	771,769	25,726	23,350	12,394
Playa Del Rey	140,398	4,680	4,722	5,727
Potrero	36,411	1,214	1,244	678
Richfield	261,703	8,723	8,751	8,820
Rosecrans	312,270	10,409	10,627	14,248
Santa Fe Springs	810,610	27,020	27,238	31,536
Seal Beach	213,140	7,105	7,115	8,118
Torrance	452,355	15,079	15,933	19,542
Whittier	26,848	895	932	957
Wilmington	2,582,531	86,084	85,833	92,356
Total	18,462,923	615,431	610,786	664,065
August	18,934,353	610,786		
Increase (*Decrease)	471,430*	4,645		

SUMMARY OF CALIFORNIA OILFIELD OPERATIONS FOR SEPTEMBER, 1939—STOCKS HELD IN PACIFIC COAST TERRITORY BY CALIFORNIA OIL COMPANIES

	Sept. 31, 1939	Aug. 31, 1939	Sept. Changes	Dec. 31, 1938 (Reclassified)
1. Gasoline-Bearing Crude	37,115,203	37,876,094	− 760,891	36,225,312
2. Non-Gasoline-Bearing Crude	14,074,602	14,266,375	− 191,773	16,282,177
3. Unblended Nat. Gas	2,049,211	2,236,222	− 197,011	2,699,455
4. Gasoline (not including distributing and service stations)	13,454,290	13,331,736	+ 122,554	13,259,369
5. Naphtha	1,487,704[1]	1,450,221[1]	+ 37,483	1,566,349
6. Gas Oil and Diesel Oil	9,979,845	10,116,384	− 136,539	10,539,937
7. Fuel Oil Residuum	68,850,703	69,779,076	− 928,373	70,957,881
8. All Other Stocks	7,647,251[2]	7,517,674[2]	+ 129,577	6,153,809[2]
TOTAL	154,658,809	156,583,782	−1,924,973	157,684,289
[1]Estimated amount of unfinished gasoline contained in item 5	1,176,350	1,172,235		1,350,379
[2]Coke included in item 8	597,023	478,374		

	New Rigs Up	Active Drilling	Producers Completed	Daily Initial Output	Active Producing	Abandoned Wells Drillers	Abandoned Wells Producers
Group No. 1							
Arvin	1	3	....	....	10	....	....
Belridge—North	..	3	....	....	72	....	....
Belridge—South	..	....	....	....	84	....	....
Canal	2	2	1	1,284	28	....	....
Canfield Ranch	..	....	....	....	1	....	....
Coalinga	10	9	7	13,218	880	....	....
Cole's Levee	1	9	....	....	7	....	....
Edison	..	1	1	60	88	....	1
Elk Hills	..	....	....	....	169	....	....
Fruitvale	..	1	1	80	174	....	....
Greeley	..	3	....	....	21	....	....
Kern River	7	7	3	26	1,501	....	....
Kettleman Middle Dome	..	....	....	....	3	....	....
Kettleman North Dome	6	15	2	2,240	229	....	....
Lost Hills	..	....	....	....	287	....	....
McKittrick	1	....	....	....	203	....	....
Midway-Sunset	2	5	3	373	2,576	....	....
Mountain View	1	1	1	120	187	....	1
Mount Poso	3	2	2	195	270	1	....
Paloma	2	....	....	....	1	....	....
Rio Bravo	2	2	1	3,200	34	....	....
Round Mountain	1	2	3	753	204	1	....
Strand	2	2	1	3,478	3	....	....
Ten Section	1	1	....	....	28	....	....
Tupman	1	1	1	148	3	....	....
Wasco	..	....	....	....	7	....	....
Wheeler Ridge	..	....	....	....	33	....	....
Group No. 2							
Capitan	..	....	....	....	44	....	....
Elwood	..	....	....	....	80	....	....
Rincon	1	1	....	....	53	....	....
San Miguelito	1	2	....	....	21	....	....
Santa Barbara	..	1	....	....	26	....	2
Santa Maria	2	2	2	1,189	265	....	1
Summerland	..	....	....	....	17	....	....
Ventura Avenue	4	13	3	1,191	266	....	....
Ventura-Newhall	4	7	2	879	554	....	1
Watsonville	..	....	....	....	7	....	....
Group No. 3							
Brea-Olinda	..	....	....	....	358	....	....
Coyote—East	..	1	....	....	76	1	....
Coyote—West	..	....	....	....	67	....	....
Domingues	1	2	3	2,497	167	....	....
El Segundo	..	....	....	....	49	....	....
Huntington Beach	2	3	1	300	531	....	3
Inglewood	..	....	....	....	213	....	....
Lawndale	..	....	....	....	5	....	....
Long Beach	1	4	....	....	1,193	....	....
Los Angeles-Salt Lake	..	....	....	....	111	....	....
Montebello	15	39	20	13,340	292	....	....
Playa Del Rey	..	....	....	....	168	1	....
Potrero	..	....	1	125	15	....	....
Richfield	..	1	....	....	292	....	1
Rosecrans	1	2	1	250	138	1	....
Santa Fe Springs	..	....	....	....	568	....	2
Seal Beach	..	....	....	....	110	....	....
Torrance	1	1	....	....	713	1	1
Whittier	..	....	....	....	145	....	....
Wilmington	10	17	12	4,771	718	....	....
Miscellaneous	6	29	....	....	....	8	....
Group No. 4—Gas Fields							
Buena Vista Lake	..	....	....	....	4	....	....
Buttonwillow	..	....	....	....	12	1	....
Chowchilla	..	....	....	....	....	....	....
Delano	..	1	..	....	1	....	....
Dudley Ridge	..	....	....	....	....	....	....
Goleta	..	....	....	....	....	1	....
Marysville Buttes	..	....	....	....	3	....	....
McDonald Island	..	....	....	....	4	....	....
Rio Vista	..	....	....	....	21	....	....
Semi-Tropic	..	....	....	....	2	....	1
Tracy	..	....	....	....	5	....	1
September	92	195	72	49,726	14,417	16	15
August	117	209	81	84,906	14,375	21	21
Decrease(*Increase)	25	14	9	35,180	42*	5	6



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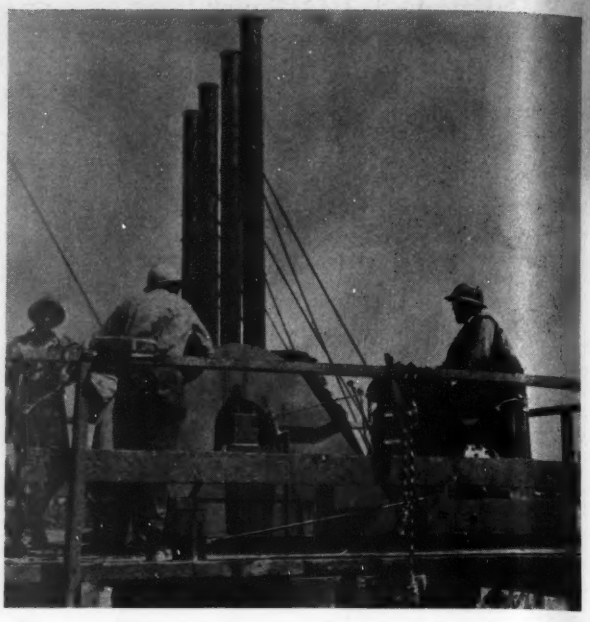
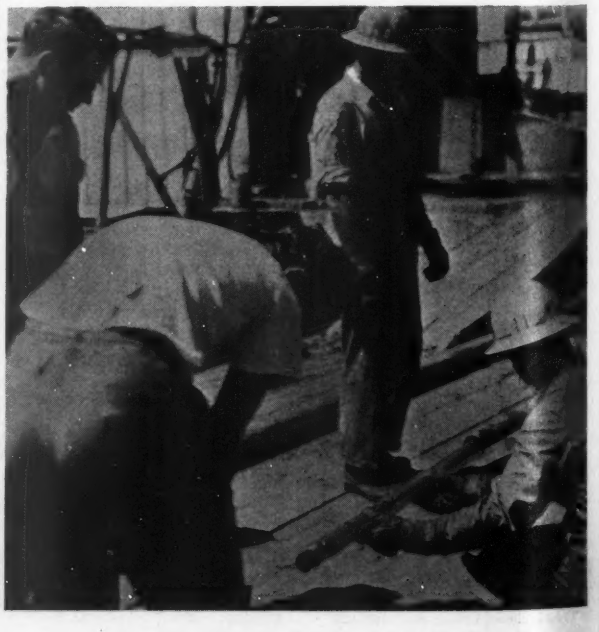


When these pictures were taken the operators were just about to discover that Darling Community No. 1, joint venture of Barnsdall Oil Co., and Wilshire Oil Co., would be a new southeasterly outpost of the Rosecrans field. The well was completed flowing 383 barrels of 31° gravity oil and 300 barrels of water. In the views shown here the boys are, above, pulling the wire line core barrel; below, looking over a 100% core recovery job by the H. C. Smith barrel.



LAUGH THIS OFF

We can find no confirmation of the prevalent rumor that a well known equipment salesman was recently asphyxiated smoking one of his own gift cigars in a telephone booth.

And **Andy Hazard** is trying to determine just for his own satisfaction why it is that the wrong numbers are never busy.

Doc Hudson, on the same subject, informs us that the employes of a Los Angeles oil concern have been using the company telephones so much for private business that they have been given a last warning to cut down the practice or there will be the old nickel to pay.

Here changing the subject, **Bob Wells** defines advertising as "stuff that makes you go out and buy a car instead of saving up for it."

And there are a lot of advertising men who are not so much worried about bill boards as they are about board bills.

Elmer De Maris offers another cute definition that is worth passing along. Sez he, "Advice is something a man gives to younger people when he has grown too old to set them a bad example."

It's a peculiar thing about advice, incidentally, that the better it is, the harder it is to take.

Now arises **Herb Eggleston** asserting that any bank will lend you money if you will simply provide proof that you're so well off you don't need it.

Herb had an odd experience a few days ago which shows very definitely that absent-mindedness is not confined to plumbers and professors. He stepped into the barber shop, and the lad in number three chair pinned a newspaper around his neck and gave him a towel to read.

And we have often wished that some smart bimbo would invent a styptic pencil to use on salary cuts.

"What are you looking for, sonny?" asked the kindly office manager. "Nothing," replied the office boy. "Well, you'll find it in the box where the petty cash was," was the final crusher.

Mark Haines here interrupts to tell about an Avila lad who went clam digging so often that he finally became mussel bound.

Avila, if you must know, is a beautiful little resort just below San Luis Obispo, where in the summer time people lie on the sands—about all sorts of things.

It's a fact, by the way, that a fellow never knows how many friends he has until he rents a cottage at the beach.

At which stage **Bill Harrod** recounts the story of a Fullerton old timer who was married for some 40 awed years.

And after a strenuous effort to confirm the report that a Signal Hill pumper beats his wife up every morning, we found that sure enough he gets up at six a.m. and she stays in bed tell seven.

Wendell Jones, the well known exponent of squash and other plants of the pumpkin family, describes a childish game as one at which your wife can beat you.

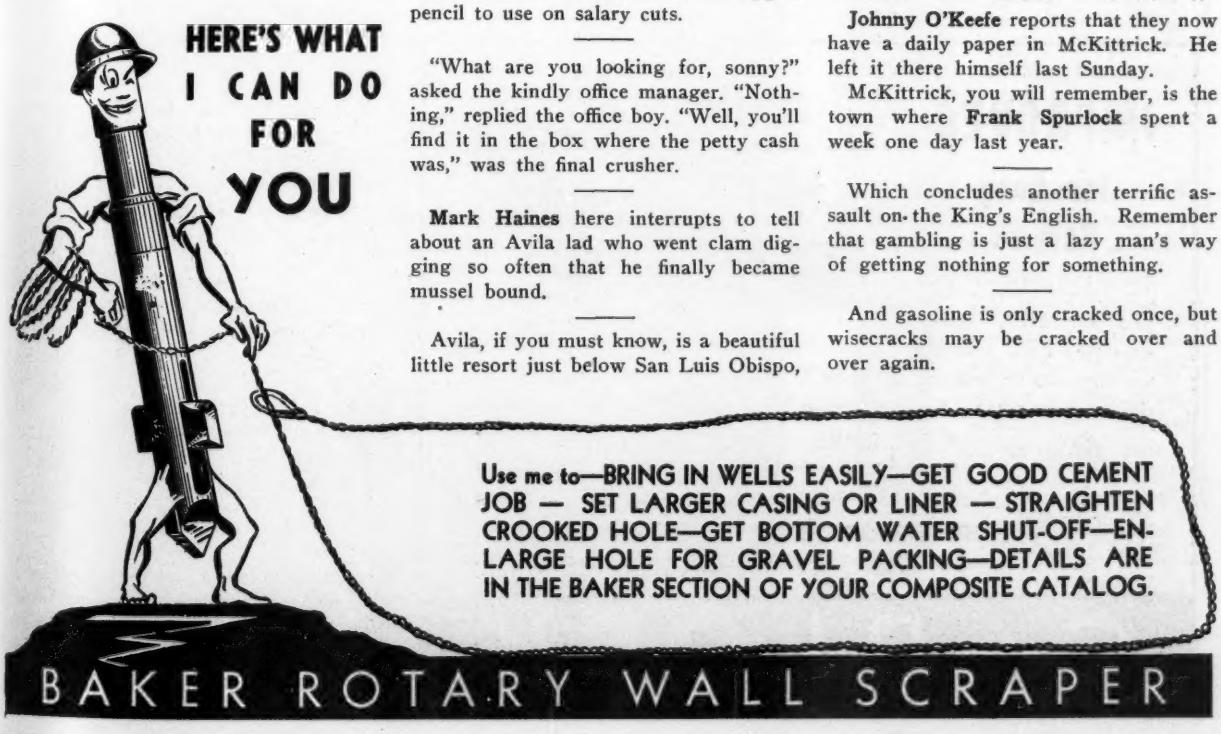
And with the approach of winter it might be well to remind you that a fur coat is not so much to keep a woman warm as it is to keep her quiet.

Johnny O'Keefe reports that they now have a daily paper in McKittrick. He left it there himself last Sunday.

McKittrick, you will remember, is the town where **Frank Spurlock** spent a week one day last year.

Which concludes another terrific assault on the King's English. Remember that gambling is just a lazy man's way of getting nothing for something.

And gasoline is only cracked once, but wisecracks may be cracked over and over again.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Use me to—BRING IN WELLS EASILY—GET GOOD CEMENT JOB — SET LARGER CASING OR LINER — STRAIGHTEN CROOKED HOLE—GET BOTTOM WATER SHUT-OFF—ENLARGE HOLE FOR GRAVEL PACKING—DETAILS ARE IN THE BAKER SECTION OF YOUR COMPOSITE CATALOG.
BAKER ROTARY WALL SCRAPER

(Continued from Page 5)

variations in density near the surface are frequently so great, he pointed out, as to obscure the influence of structures at greater depths within the sedimentary mass. In many places, more particularly along the eastern portion of the Valley, the variations of density within the Basement Complex influence the distributions of gravitational forces more strongly than the structures within the sedimentary blanket. The torsion balance, he said, did not lead directly to the opening of any new field, but did give us a more exact knowledge of the general geologic structures in the various areas and paved the way for later work which has succeeded in finding new fields.

The Holweck-Lejay inverted pendulum, Mr. Vaughan said, "is intended for making general gravimetric surveys over large areas. About three years ago Shell Oil Co. began work near Hanford and carried the gravimetric survey northward to include virtually the entire Sacramento Valley. This survey confirmed what had already been inferred from previous work in the San Joaquin Valley—that the Sacramento Valley is structurally similar to the San Joaquin Valley, that indeed, the two valleys are structurally a unit. The Sierra Nevada basement block slopes westward beneath the Sacramento Valley, and the axis of the synclinal trough of the Valley is close to the western margin."

Refraction Seismometry, said Mr. Vaughan, "is essentially the study of artificial seismic waves set up by heavy explosions which have penetrated the earth to deep high velocity zones and then have come back to the surface. Experimental work was carried on in California early in 1925, but not until the summer of 1927 was there any regular survey made. At that time the Shell Oil Co. began operations in the San Joaquin Valley. Later the Standard Oil Co. did some work on the west side of the San Joaquin Valley. Several parties were active from time to time for the next three years, but they were on contract work and it is not known with certainty for what companies they were working. No really extensive surveys were carried out as it was soon learned that in California the usefulness of the method is rather limited. Moreover, the costs of operations were very high; dynamite alone was one considerable item as some parties used more than two carloads per month. Damage claims were frequent and, although the actual damage done was slight, they offered a real obstacle to the progress of operations in populated areas such as the Los Angeles Basin and the Oxnard Plain."

Reflection Seismometry, the author said, "is the study of artificial seismic waves generated by small shots of dynamite, which have penetrated the earth to some depth and have been reflected back to the surface of the ground from boundary surfaces between rocks which transmit seismic waves with different velocities. This method is somewhat slower than the refraction method in covering large areas in those regions where both will discover the important structures; as for example the Gulf Coast region where both have been successful in finding salt domes. However, it has proved to be effective in many areas where no other method has been at all satisfactory. It is capable of measuring dips and strikes and of carrying correlations in structures of small pattern. Besides its success in making measurements it has a distinct advantage over gravimetric, magnetometric, and electrical methods in that the quantities used are familiar to the geologists."

Read Winterburn, petroleum engineer for Union Pacific Railroad Co., in his paper on "Effect of Faulting on Accumulation and Drainage of Oil and Gas in the Wilmington Oil Field," presented a valuable contribution to the geological and engineering literature of the Basin. The paper will be published in the California Oil World when necessary permission is obtained from the A.I.M.E. Here it is only possible to present Mr. Winterburn's summary and discussion, as follows:

"The distribution of gravities and edgewater conditions on the various fault blocks indicate that the Wilmington Oil Field is divided by faults into at least five separate structural traps. Accumulation apparently occurred in each of these traps independently without movement of fluid across the faults forming the boundaries between them.

"Study of formation pressures and variations of gas-oil ratios since the beginning of development of the field shows that the faults are still effective barriers to the movement of fluid from one fault block to another, even though pressure differentials of 400 pounds per square inch across the faults have been developed at some places. Further evidence that the faults are effectively sealed is the fact that no movement of water from water sands into oil sands across the fault contacts is apparent to date, in spite of development of appreciable differential pressures.

"In speaking of the faults as being effectively sealed, it cannot be positively asserted that there is absolutely no movement of fluid through the fault. However, the rate of any such movement which may have occurred to date has apparently been negligible in comparison to the rate of withdrawal from the reservoir. The possibility of such slight movements being accelerated, or even a sudden failure of the sealing effect at a fault contact if excessive pressure differentials are allowed to develop, should not be disregarded.

"The conditions at the fault contact resulting in the development of an effective seal are subject to conjecture. The Terminal Zone consists of alternating beds of sand of varying thickness up to 50 feet interbedded with layers of shale which only occasionally ex-

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ceeded 20 feet in thickness. Where different sections of this zone are in contact along a fault, sand is in contact with sand across the fault throughout more than half the interval and sealing therefore cannot be attributed to sands being in contact with shale. In some cases, where the faults have been cored, a foot or two of crushed material resembling fault gouge has been recovered. Often no such material has been recovered, possibly due to incomplete core recovery, although a zone is generally present varying from 10 feet up to 50 feet or more in which the shale is fractured and slickensided and the sand noticeably crushed and sheared, with thin seams of clayey material along the shear planes. Thus the sealing effect could be attributed to the presence of a continuous layer of impervious gouge material along the fault contact, or to the fact that each bed of sand has been rendered relatively impermeable immediately adjacent to the plane of movement due to the crushing and shearing and development of thin seams of clayey material cutting across the bedding planes.

"If a thin layer of gouge material forms the seal it is conceivable that development of large pressure differentials across the fault might result in sudden failure of the seal, allowing rapid movement of fluid across the fault. On the other hand, if a reduction of permeability of the sand bodies adjacent to the fault is the cause of the sealing effect, a slow infilteration of fluid across the fault may result from differential pressures. The rate of any such movement would be expected to increase with increase of differential pressure, but would probably always be less than the rate through sands unaffected by the fault movement.

"The adaptation of a development campaign to such conditions in a field would involve the following considerations: 1. Desirability of completing each well to produce from only one fault block thus avoiding the possibility of the well acting as a channel for the movement of oil, gas or water from one fault block to another due to differential pressures. This would involve deviation from any rigid well spacing program to allow proper location of wells with respect to the faults. 2. Possibility of developing adjacent areas on different fault blocks with different well spacing without drainage losses from the more widely spaced to the more closely spaced area. 3. Possibility of delaying development on fault blocks on which competitors are not active without suffering drainage losses.

"Factors to be considered in producing from a field comprised of individual structural traps separated by sealed faults: 1. Probable encroachment of edge water on each block as a unit independent of adjacent blocks. The rate of encroachment and tendency to develop irregular encroachment will depend on reservoir and drainage conditions on the individual blocks. 2. Possibility of the rapid encroachment of water adjacent to faults where low pressure areas are developed due to concentration of drilling and heavy withdrawals. 3. Possibility of the development of secondary gas caps at the apex of the individual structural traps causing excessive gas-oil ratios in structurally high wells. 4. Treatment of each structural blocks as a unit in application of any secondary recovery methods with probable effect of minor faults on the individual blocks also taken into consideration."

Eugene B. Waggoner, in a section of

Ed Kasey, left, Dormax superintendent, examines a 5⅝-in. bit held by Paul Thompson, of H. C. Smith. The Signal Hill deep test Kasey is bossing is his second on the Hill.

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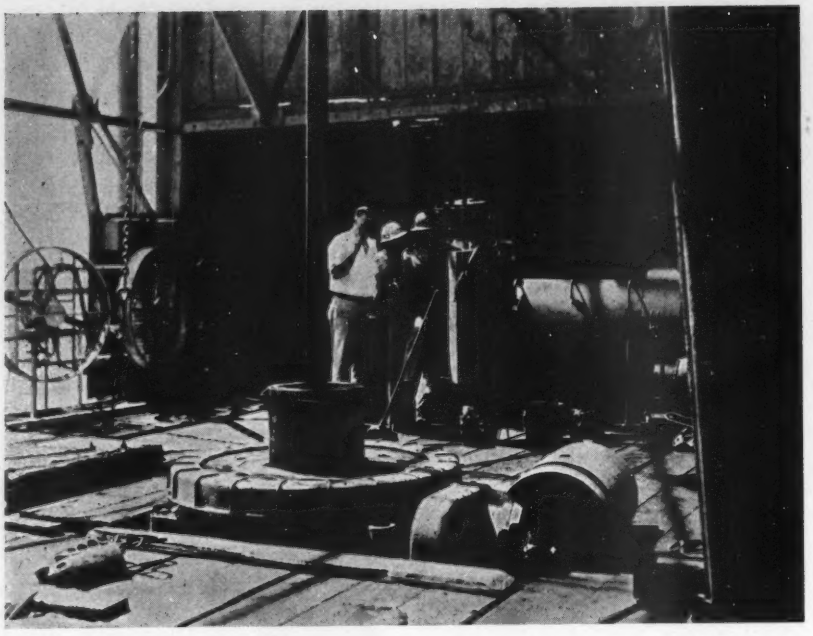


Here's Superior's super-rig on Burner No. 1. In the white shirt is Don Cook, production superintendent.

Unitization is carried out a long way on Standard's No. 20-4, Coles Levee.

his M.A. thesis, entitled "The Buried Schist Surface of the Los Angeles Basin," said, "Although oil production was not a primary issue of this study, certain points concerning the schist were brought out which should be mentioned. Examination of schist cores showed that the schist surface was highly weathered and fractured in some places and quite hard and fresh in other places. Oil is produced from the schist only where it is highly fractured or weathered to such an extent as to be as porous as a conglomerate or sandstone. Considerable oil has been produced from the schist at Venice, Del Rey, and El Segundo, but production shrinks to nothing toward the south where the schist is separated from the nodular shale by considerable thickness of sediments. This latter fact supports Hoots' (Harold of Richfield) theory that the nodular shale is the source of oil for the conglomerate and schist at Venice and probably other fields.

"In closing the writer has summarized the points discussed herein as follows: 1. 'The buried schist' surface of the Los Angeles Basin is very rugged with relief between highs and lows varying from 3500 to 10,000 feet. 2. The development of this relief is partly the result of post-burial folding and faulting which accentuated pre-burial schist structures. 3. The schist surface may extend for a considerable distance east of the Newport-Inglewood belt, dipping at an angle of 18-20 degrees, thus explaining the great depth to the basement rock in the central part of the basin. 4. In places the schist of the Los Angeles Basin contains the same minerals which are characteristic of the Franciscan complex of Central California.

"Some suggestions which have come to mind as a result of this study are: 1. Since the profile sections shown in this paper represent only a few of the many possibilities for sections, it seems unlikely that all the schist 'highs' in the basin have been shown. Since schist 'highs' seem to be closely connected with oil production, exploration for additional schist 'highs' may be justified. Such exploration, however, will have to be at least 10,000-12,000 feet deep and should be guided by geophysical data. 2. Another point to consider is whether the nodular shale is near enough to the schist or its overlying conglomerate to supply it with oil. Apparently farther south in the basin where the schist and the nodular shale are separated by considerable thickness of sediments, the schist is not productive. 3. One other possibility for oil exploration is overlap against the tilted schist block caused by transgression of the sea from the east and south in Middle and Upper Miocene. Such a possibility would, however, involve other factors such as source beds, etc."

A successful gas storage project was described by Jay B. Wharton, of Belridge Oil Co., in his paper on "Repressuring Operations in the Belridge Oil Field." In June 1938, the writer said. "Some experiments were carried out to determine what pressures were necessary to produce flow of gas at desired rates into the Temblor formation. In these experiments a line was run from a high pressure, high gas-oil ratio Wagonwheel well to a low pressure Temblor well and gas permitted to flow from one into the other at measured rates and pressures. It was found that a 5 million cubic foot rate could be maintained at a pressure of 2050 pounds per sq. in. and a 10 million cubic foot rate at a pressure of 2150 pounds per sq. in. This indicated that

by using several injection wells any load then anticipated could be handled at pressures under 2000 pounds.

"As a result of these tests a compressor plant was constructed to supply the needed injection pressure for storage of gas. The plant is composed of six Cooper-Bessemer Type G-MR angle compressors of 300 H.P. rating at 300 R.P.M.

"The gas enters the suction to first stage compression at 425 pounds, which is compressed to 1000 pounds, which in turn is boosted to present injection pressure of 1750 pounds by second stage compression—there is no inter-cooling between stages—the first stage cylinder of 7 in. x 14 in., second stage cylinder 5 in. x 14 in. bore and stroke dimensions. Each engine unit has a capacity of 3250 M.C.F. under the existing operating conditions. At present writing two of the six units are being utilized for other purposes in the lower pressure ranges. The cooling and circulation of engine jacket water is accomplished by six cylinder Waukesha Units direct connected to centrifugal pumps which are supported by automatic electric pumps, as standby units for emergency purposes. Cooling tower is of the fully enclosed down draft type—equipped with adjustable louvres for controlling the inducement of draft through the tower.

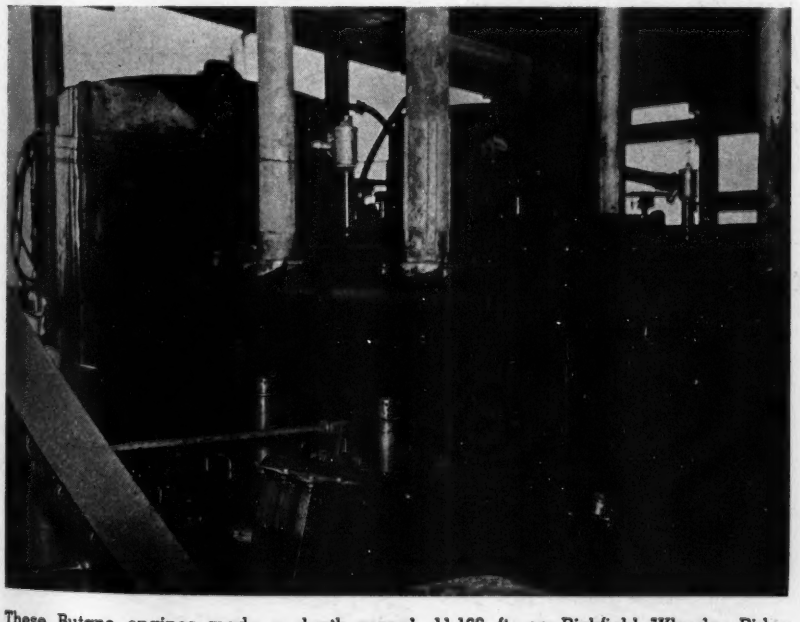
"Rates of gas injected to the individual wells are controlled separately by 2-in. flow beans of the needle valve type, with calibration in 64ths of an inch . . . Wet gas from high pressure traps of Wagonwheel wells is conveyed directly through the high pressure gathering system at 480 pounds pressure to the high pressure gasoline absorption plants of which there are two practically identical in design and capacity, each capable of processing 80,000 M.C.F. of gas at 425 pounds discharge pressure. The gas from the low pressure traps at 125 pounds pressure is conveyed to an intermediate compressor plant where it is boosted in one stage to 480 pounds pressure and discharged into the high pressure gathering system. Prior to repressuring this compressor plant handled most of the gas from Temblor wells also.

"The high pressure gas injection system not only extends to all Temblor wells so that gas may be injected into any desired well but is also carried to all new Wagonwheel wells which are unloaded of water and drilling fluid upon completion by high pressure gas through flow valves spaced at suitable intervals in the flow string. In the future this system will supply gas for gas lift operations when Wagonwheel wells cease to flow naturally.

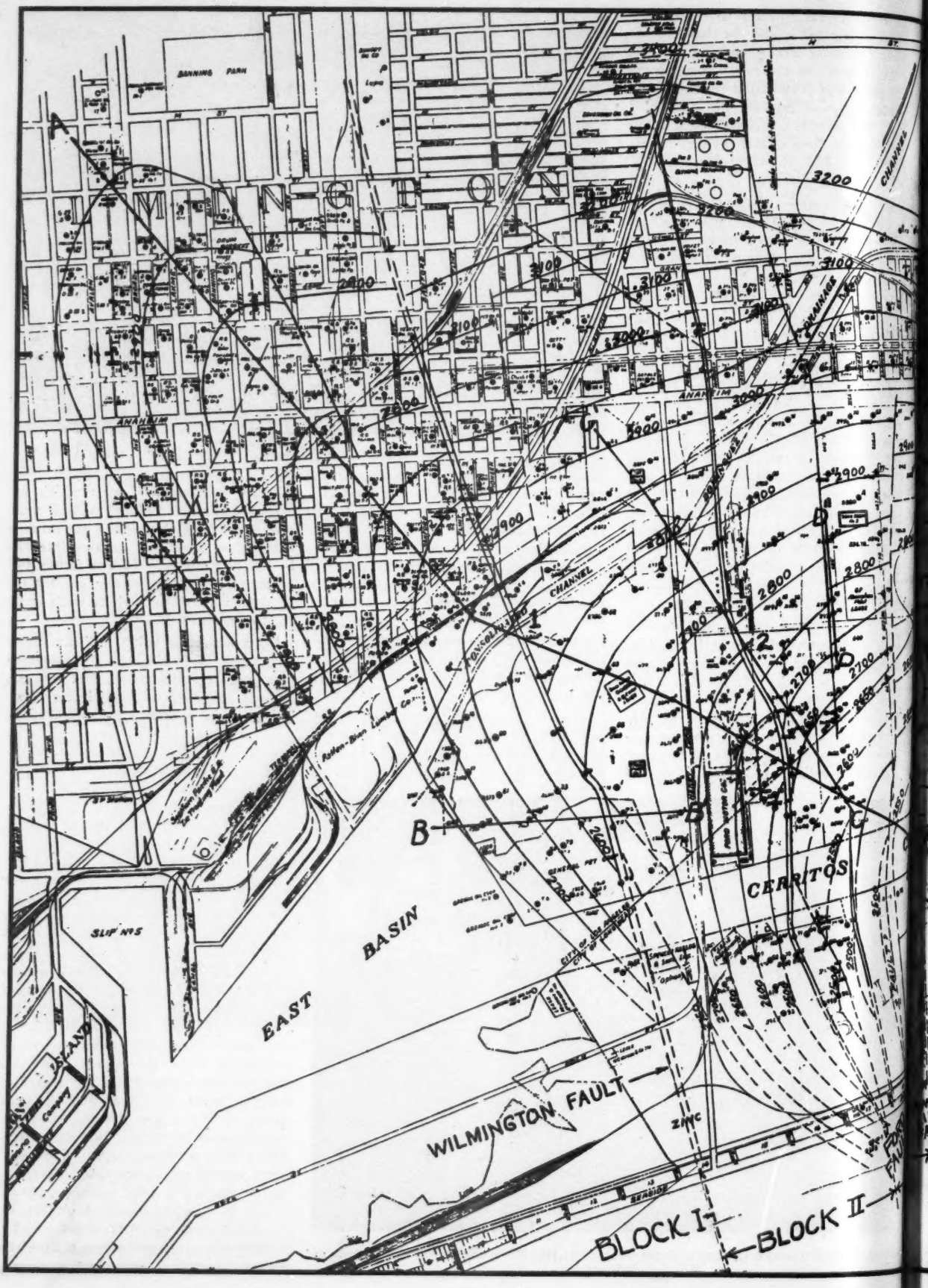
"It is desired to point out," the author concluded, "that the primary object of this project is the storage of dry gas necessarily produced beyond market requirements, and viewed as a conservation measure it is considered successful. However, it is felt that it is too early and the data all too few to make any intelligent estimate of the benefit in the form of increased ultimate recovery due to the restoration of energy to the pool in the form of compressed gas."

Dr. Stanley S. Herold, Consultant, asked the question, "Must We Look for a New Reservoir Control?" and suggested: "Whereas by molecular physics we can determine fairly well the state of the reservoir at any designated point outward from the well, and this at any designated instant during the history of production from the well, by molar physics we keep an account of the reservoir at large during the course of production from the various wells so that we may predict with a fair degree of accuracy what is to happen in the near future. Is it not clear that the molecular consideration of energy, fluid movement, bottom-hole pressure, index of productivity, gas-oil ratio, core analysis, porosity, permeability and surface tension effects in mixtures of the fluids can be combined advantageously with the molar consideration of well-spacing, reserves ultimate recovery, percentage recovery,

Laying a pipe line by Superior's Burner No. 1.



These Butane engines made a depth record, 11,168 ft. on Richfield Wheeler Ridge wildcat.


SIGNAL HILL
LONG BEACH
BANNING PARK
ANAHEIM
CHANNEL
SLIP NO 5
EAST BASIN
CERRITOS
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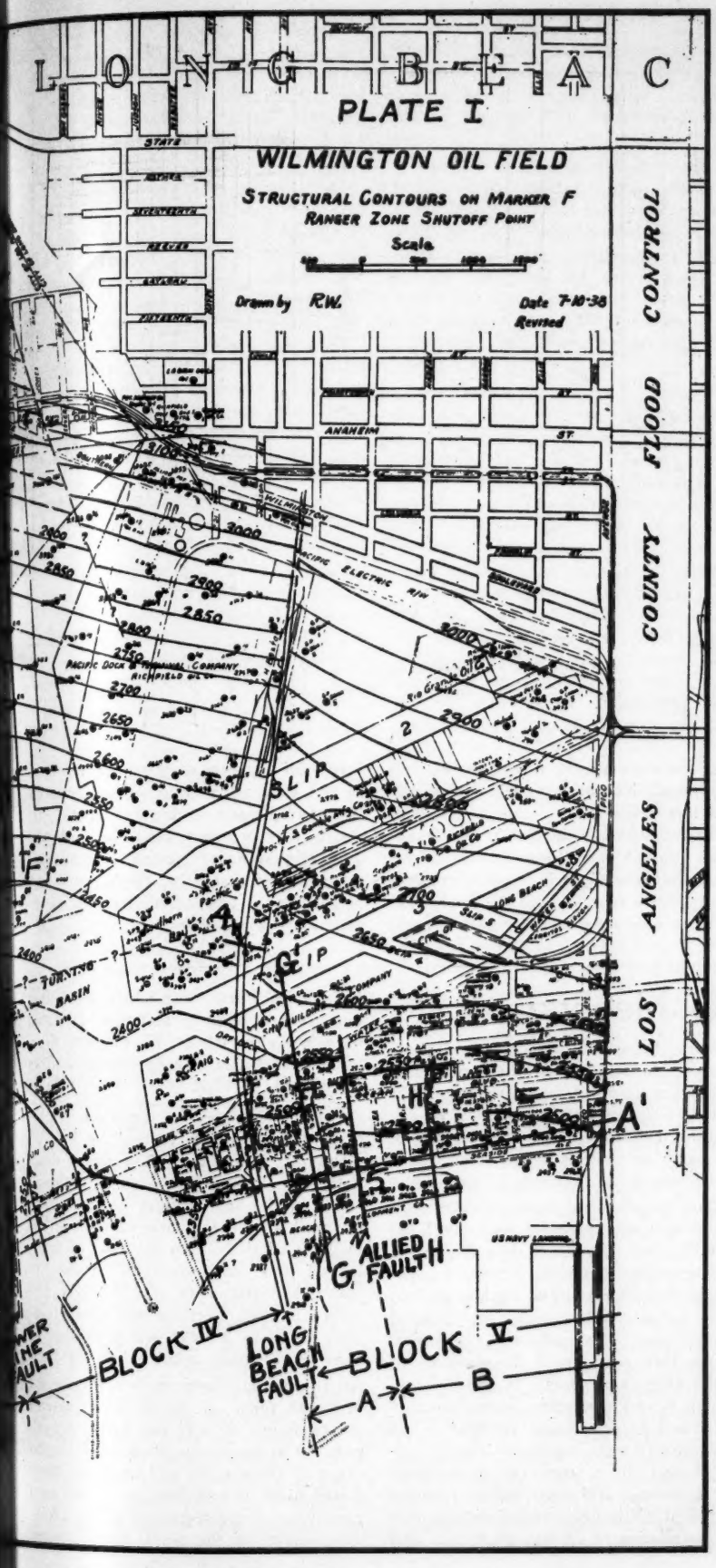


repressuring, pressure maintenance, edge-water encroachment, drainage, and the effects of curtailed production?

"Fifty years ago there was a conflict between the molecular concepts of thermodynamics and the molar concepts of theoretical mechanics. Since then we have learned to use the two jointly. Now in our present circumstances it seems that we face a like situation wherein the concepts of thermodynamics are replaced by those of hydrodynamics. Shall we not learn soon to use these two jointly? It is with this in mind that the present paper concerning the possibility of the

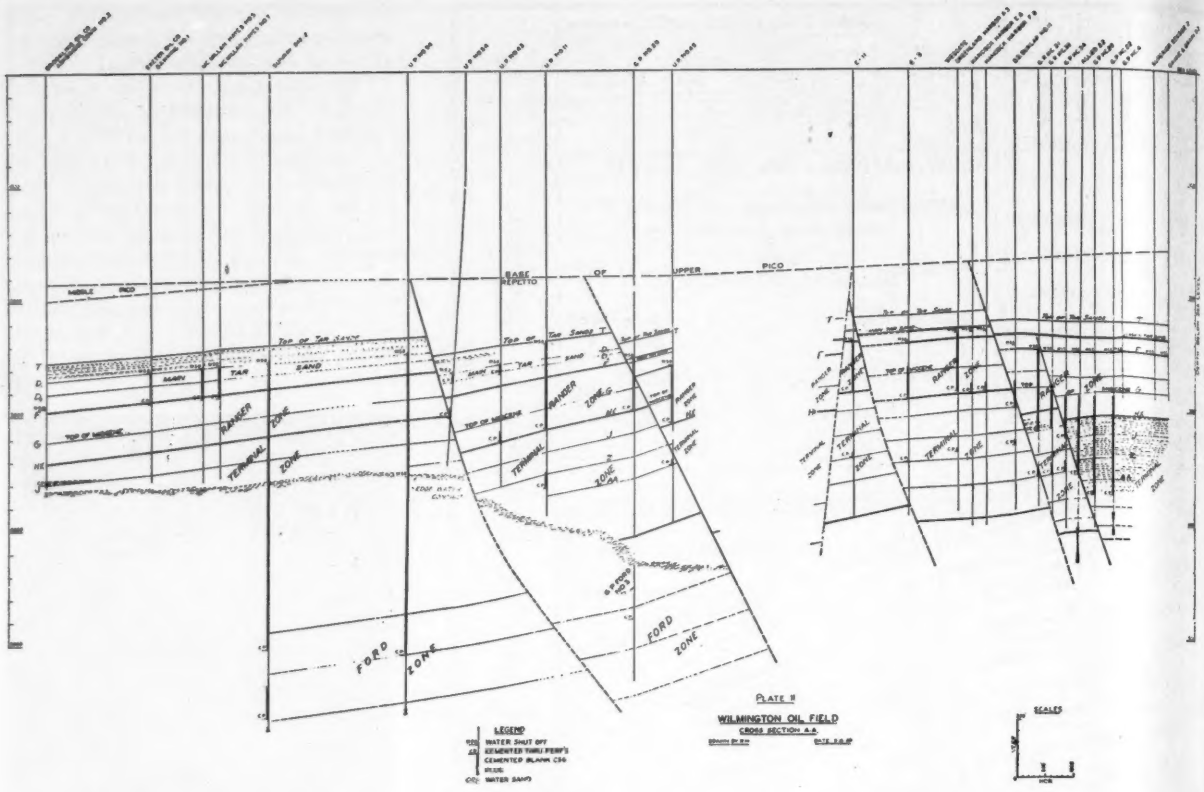
Harold Hoots

existence of a finite control hitherto unsuspected is offered today to our petroleum technologists."

Allan H. Hand, Economist, in closing his highly significant discussion of "Consumption Versus Normal Demand for California Crude Oil," said: "The situation is more acute when it is recognized that practically all available storage in the state is about filled to capacity.

"Where then would we be today if the current shipments to the Atlantic Seaboard and Europe were eliminated, to say nothing of shipments to the Orient? Shipments to the Atlantic Seaboard and Europe during the first eight months totaled ten million four hundred thousand barrels, principally gasoline and fuel oil. Without this business it is quite apparent that the industry in California would today be in the same chaotic condition that it went through during the last half of 1935 and the first two months of 1936.

"It would therefore seem that until production can be reduced to demand



levels, normal demand and consumption will have to be considered synonymous in California. This does not mean, however, merely a balancing of production with consumption. Something will have to be done at once towards an orderly liquidation of the excess stocks that the purchasing companies have been carrying, so large a part of which, as just mentioned, has been added during the past two years.

"In conclusion, I feel," said Mr. Hand, "that, present conditions continuing, we can look for a slight increase in requirements next year. That if production could be reduced somewhat from present levels for the rest of this year and held at not over an average of six hundred thousand barrels a day for next year, satisfactory progress would be made towards liquidating the existing acute storage situation, stabilizing the industry and protecting the wages and positions of its thousands of workers."

Pacific Section A. A. P. G. Meeting

The Pacific Section of the American Association of Petroleum Geologists is holding its sixteenth annual meeting Nov. 9-10, at the Ambassador Hotel, Los Angeles. The papers to be presented are as follows:

"Address by National President of The American Association of Petroleum Geologists," by Henry A. Ley: "Continuing Exploration"—In spite of currently large petroleum reserves we should not accept a spirit of smug complacency which would relegate the need of continuing exploration to some future time. Our national economy calls for continuous and widely supported exploration—certainly the maintenance of adequate geological and geophysical arms of the industry.

"Research Program of The American Association of Petroleum Geologists," by A. I. Levorsen.

"Geochemical Prospecting," by E. E. Rosaire, Subterrex. Geochemical prospecting can be divided into surface and subsurface geochemical prospecting. The former relies upon the analyses of soil samples collected along the surface of the earth at shallow depths, and yields two dimensional information and maps. Surface geochemical anomalies are associated with the presence and areal extent, but not the depth nor the relief, or favorable structure. Surface geochemical prospecting is further divided into topsoil and subsoil geochemical prospecting. Subsurface geochemical prospecting relies upon the analyses of well cutting and cores. It yields information in one dimension, along the vertical, and is commonly referred to as geochemical well logging. These various forms of geochemical prospecting are discussed, and their salient features described. The geochemical data permit the correlation of various geological and geophysical phenomena which previously appeared unrelated, and, in addition, have brought to light, for the first time, other phenomena of economic as well as theoretical interest.

"Facies Changes in the Upper Miocene of San Joaquin Valley," by Paul P. Goudkoff, Consultant. The paper deals with the Delmontian Upper Mohnian strata of the San Joaquin Valley, which are well known for their extreme lithological variations. On the basis of lithological and paleontological studies of material obtained from 150 wells and several surface sections the whole column has been divided into a number of units representing definite time divisions. An attempt has been made to define the principal types of micro-faunal assemblages found in different parts of each unit, to appraise the ecological significance of these types and to survey their distribution in relation to lithological variations of the sediments of each unit. The results of the study are illusrated

by lantern slides showing: (1) lithological features and organic content of the recognized facies; (2) areal distribution of the facies, and (3) isopachous maps of the Delmontian and Upper Mohnian beds. (Presented with permission of the Geological Society of America.)

"Pliocene of the San Joaquin Valley, California," by W. F. Barbat, Standard Oil Co. of California. The Pliocene of the San Joaquin Valley is defined and a description given of the sediments and the invertebrate fauna. Attention is called to diastrophic history, the geologic occurrence of land vertebrates, and to the physical conditions under which the sediments were deposited. To facilitate the presentation of the subject several new names for stratigraphic units, faunal zones and diastrophic disturbances must, unfortunately, be used. To chronologize the Pliocene it will be necessary to refer to some heretofore unused time names. All new names, however, are used informally.

"Arabian Geology and Topography," by Max Steineke, Standard Oil Co. of California. General map of Arabia will be shown as well as moving pictures of typical desert scenes.

"Interpretation of Core Analyses," by Frank Hornkohl, Consultant. Permeability is a measure of the fluid passing ability of a porous material. Porosity is a measure of the void space in the sand that can be occupied by a fluid. Water saturation of a sand is the total amount of water in per cent present in the void space in the porous material. This includes the connate water, drilling fluid, and actual water present. The larger the diameter of the core sample, the more accurate the determination. Oil saturation is only of comparative value, because in deep samples of light gravity oils, only the residual oil is present, the other lost because of temperature and pressure conditions present. Permeability and porosity determinations for the entire oil sand area plus bottom-hole pressure from which a specific productivity index can be determined make it possible to predict fairly accurately the gross barrels per day per foot of sand.

"Comparative Columnar Sections of the Domengine-Arroyo Hondo Sandstone Intervals between Cantua Creek and Waltham Canyon, Coalinga District, California," by J. Q. Anderson, Union Oil Co. of California. Presentation of a series of slides showing 13 hand-leveled surface columnar sections of the Domengine-Arroyo Hondo sandstone intervals measured at varying distances between Cantua Creek and Waltham Canyon. Correlation of all sections is based on the "black pebble bed" or Domengine Reef. Discussion involves demonstration of lateral variation and facies changes in lithology of both intervals. Deals briefly with Domengine-Kreyenhagen contact, fossil occurrences, and contact relations of the Arroyo Hondo sand with Arroyo Hondo shale and the Moreno shale.

"An Eocene Section at Point of Rocks, Kern County, California," by Harry B. Allen, Student, U.C.L.A. The sedimentary sequence and formational age of the Eocene rocks in northwestern Kern County have been the subjects of controversy. The results of recent field and paleontological work, conducted in an attempt to clarify the problem, are presented in this paper.

"Problems of Sediment Transportation Off the Coast of California," by Roger Revelle, Scripps Institution of Oceanography. Several kinds of evidence obtained in recent investigations suggest that water movements of sufficient strength to move sand grains over the bottom may exist at least occasionally at all depths in the open sea. Sediments are absent from topographic highs rising one or two hundred fathoms above the general level of the sea floor even at depths of two miles or more. Thin layers of well-sorted fine sand intercalated with thicker layers of clayey muds are characteristic of inshore basins off Southern California at depths of over half a mile and at distance of thirty or more miles from land. Current velocities of nearly one-half knot were measured within two feet of the bottom at 1100 fathoms in the Santa Cruz Basin south of Santa Cruz Island, 500 fathoms below the sill or threshold of the basin. Other similar measurements show that the strongest bottom currents shift irregularly in both speed and direction. They may be regarded as representing lateral turbulence or eddy motion in which eddies have vertical axes and are perhaps a few miles in diameter. The presence of silts and muds on the bottom in certain areas of highest observed velocities indicates that these eddy currents are not competent to prevent all deposition. Since evenly distributed eddies cannot alone produce any net transport, other factors such as the gravitational component down slope and steady weak currents must cooperate in preventing deposition on certain areas of rocky bottom and in transporting debris to the regions of accumulation.

"Geological Observations in Italian East Africa," by Francis D. Bode, California Institute of Technology. Topographically and geologically, Italian East Africa can be divided into three principal areas: (1) the "Ethiopian Plateau," which occupies the northwestern third of the country; (2) the "Rift Valley Depression," which divides the entire country in two; and (3) the "Somaliland Plateau," the country lying to the south and east of the Rift Valley. The Ethiopian Plateau consists of a series of tablelands, often of great elevation, with ranges of high and rugged mountains dispersed across its surface in rugged confusion. This high land area is composed of a thick series of lava flows which rest either upon old plutonic rocks or upon a thin section of Mesozoic sediments. The Rift Valley Depression is a long, and generally narrow, trough which trends in a northeasterly direction across the country from the southwest corner of Abyssinia to near the junction of the Red Sea and the Gulf of Aden. Towards the northeast the trough widens and the scarps which form its sides become continuous with those on the eastern side of the Red Sea and the south side of the Gulf of Aden. For the most part, the floor of the depression is covered by lava flows of Tertiary age. The Somaliland Plateau is a great area of monotonous relief which slopes very gradually, from elevations near 5,000 feet along the Rift Valley and the Gulf of Aden, southeastward to the Indian Ocean. Most of this plateau is covered by sediments of Mesozoic and early Tertiary age.

Informal Symposium on Recent Petroleum Discoveries in California.—These are extemporaneous papers on areas of current interest and they are not intended for final publication at this time. Discussion is invited, but deference should be given to the fact that insufficient information is available on many of these for final conclusions to be reached. (a)—"East Coalinga and Amerada Area" by L. S. Chambers, Seaboard Oil Co. (b)—"Coles Levee Oil Field" by R. Eckis, Richfield Oil Corp. and G. Gariepy, Ohio Oil Co. (c)—"Paloma Field" by R. W. Clark, Western Gulf Oil Co. (d)—"Strand Oil Field" by S. A. Menken, Tide Water Associated Oil Co. (e)—"South Mountainview Field" by J. R. Dorrance, The Texas Co. (f)—"Aliso Canyon Field" by C. E. Leach, Tide Water Associated Oil Co. (g)—"West Montebello Field" by Vernon L. King, and H. M. Preston, Consultants. (h)—"Summary of Developments of Northern California Gas Fields" by J. R. Dorrance, The Texas Co.

Resistant Rubber New Oil Product

Petroleum's newest patented by-product is a stable rubber-like fiber, said to make textiles of superior wearing resistance. Basis of its manufacture is isobutylene, a petroleum refinery gas produced by the cracking process.

Oxygen, acids, and alkalis have little deteriorating effect on the new fabric.

More Racking Space In New Type Derrick

A new type derrick providing more pipe racking space has been designed by Stoddard-Rawson, Inc., designers of the Consolidated Steel Derrick. Deep hole drilling, together with larger and heavier blocks and swivels, has cramped conventional derricks at the finger board to a point where special, high derricks

were introduced, principally to provide room for the increased amount of pipe standing in the derrick. The new type derrick was erected for the St. Anthony Oil Corp.'s Gordon No. 1, at Rosecrans.

The new derrick is a 136', 26' base, 5'6" top, and 600,000-pound capacity Consolidated Steel Derrick of the new bulge design and provides 50% more pipe racking room than the standard 136' tower. This is accomplished, in brief, by providing an outside chamber on one side of the derrick to receive the stands of pipe. This chamber, or bulge, does not in any way change the stress distribution in the tower, as it is simply a gradual extension of the girts to a point at 94 ft. where the bulge is at its maximum of 2'9", and thence tapering back again to meet the derrick legs at the top. All loading is taken through the standard legs which have the same batter and function identically as in a conventional 136' tower.

This derrick was erected for the St. Anthony Oil Corp. by the Owl Truck & Materials Co., who for the past year have been active in the erection of steel derricks in California, and its practical design is attested by the fact that no extra time was required in erecting this derrick over a conventional 136' tower. It is understood that this new design involves but little cost over the conventional type, since little extra steel is required in its manufacture.

According to Stoddard-Rawson's engineers, the new bulge can be built into any size derrick and could be increased to accommodate even more pipe. However, the present 50% increase in racking space would seem adequate for all practical purposes.

Numerous operators and engineers have already viewed the new tower and expressed approval of the practical design which answers the demand for more pipe racking space, Stoddard-Rawson engineers say.

New Type Stoddard-Rawson steel derrick.

Scientific Prospecting Finds 25 Oil Fields

Accuracy of modern oil prospecting has led to the discovery, 10,000 to 13,000 feet below the earth's surface, of 25 new oil fields. All have been proven productive within the last 2½ years.

Ten years ago oil-bearing rocks seldom were "mapped" deeper than 9,000 feet. Today seismograph recordings of structures at 13,000 to 15,000 feet are routine procedure; some have reached 25,000 feet.

Similarily, drilling depths nearly have doubled within the last 12 years. The 8000-foot drilling record of 1927 has been increased by 7,000 feet. The past 1½ years alone have been outstanding, adding nearly 3,000 feet to depth records as the drill reached 13,000, 14,000 and 15,000 feet for the first time.

Of the 312 wells that have been drilled below 10,000 feet since that level first was reached eight years ago, 246 or 80 per cent have been made in the last 18 months.

A new wall plaster having many characteristics of wood is designed for use in art museums and other places where nails are to be driven into walls.

Field Development

San Joaquin Valley

22 Strings Working At Kettleman Hills

Kettleman Hills continues to hold a leading place in California drilling activities with twenty-two strings running. Standard Oil Co. leads with fifteen heavy rigs at work, Kettleman North Dome Association is operating six strings, while Superior Oil Co. drills Huffman No. 4 at 9426 ft. on its way to the deep zone.

Latest Eocene completion was Standard's 2-19J at the north end of the field. Bottomed at 10,950 ft., production gauged 1000 bbls. of oil and 6,500,000 cu. ft. of gas.

Buttonwillow Test Sets Protective String

Having twice been forced to redrill because of a caving hole, Union Oil Co. set 9422 ft. of 8⅝ in. casing in Bowerbank No. 4-23. The hole, located in sec. 23,29-24 of the Buttonwillow district, was drilled to a 10,270 ft. bottom prior to redrilling operations. Last reports from the well place the drill at 9960 ft.

Union's well is four miles southeast of California Exploration Co.'s 12,989 ft. wildcat which demonstrated the presence of oil sands too tightly packed, at that point, for commercial production. First promising sand was found at 11,533 ft. in the recently abandoned test.

Fruitvale Test Cores Gray Sand

Richfield Oil Corp.'s West Fruitvale outpost, KCL No. 83-29, is reported coring gray sand at 3410 ft. The test is located as an outpost try near the east quarter corner of the northeast quarter of sec. 29,29-27. At the south quarter corner of the section Shell Oil Co. drilled KCL No. A-58-29 to 7214 ft. without finding a productive sand.

SAN JOAQUIN VALLEY WILDCATS

Area	Well	No.	Section	Depth	Status
	Fresno County				
Coalinga	Migs Oil Co.	7	11, 20-14	529	Pumping
	Rylatt, Harry E., Kipling	3	26, 20-14	2010	Idle
	Stuart Oil Co.	1	12, 21-14	1410	Flowing water
	Wilshire Annex Oil Co.	64–30B	30, 19-16	8383	Completing
Fresno Area	Seth Turner	1	4, 14-19		Rig
Gatos Creek	Gatos Creek Oil Co.	1	19, 19-13	415	Idle
	Kern County				
Arvin	Morton, Lindley C.	B-F 1	25, 31-29	5977	Abandoned
Antelope	Par Petroleum Co.	1	32, 25-17	3032	Idle
Buena Vista	Gen. Pet. Corp., B.V.A.	1	1, 32-24	10402	Drilling
	Richfield Oil Corp., B.V.A.	81–36	36, 31-25	10027	Drilling
	Shell Oil Co., B.V.A.	45–9	9, 32-25	9672	Drilling
Buttonwillow	Union Oil Co., Bowerbank	4–23	23, 29-24	10270	Redrilling
Devil's Den	Herzog, Raymond D.	1	27, 25-18	710	Cleaning out
	The Texas Co., Beer	1	6, 26-19	3269	Drilling
	Trigg, H. C.	1	11, 25-18		Location
	Emigrant Hill Oil Co.	1	24, 25-18	4271	Idle
Edison	El Tejon Oil & Ref. Corp., Douglas	1	32, 29-29		Rigging up
	O'Rielly, Francis, Edison-Land	2	5, 30-29	4103	Testing
Fruitvale	Richfield Oil Corp., KCL	83–29	29, 29-27	3410	Drilling
Greeley	General Pet. Corp., Farrand	1	12, 29-25		Grade
	General Pet. Corp., Sullivan	1	12, 29-25	11386	Testing
	Standard Oil Co., KCL	12–5	7, 29-26	10895	Drilling
	Standard Oil Co., KCL	12–7	7, 29-26		Location
Kern Front	Crestmont Oil Co.	C-H 1	22, 28-28	2950	Abandoned
Kern River	Sleeper Ridge Oil Co.	1	15, 29-28	1765	Idle
McKittrick	Burt & Taylor, Taylor	1	30, 30-22	300	Drilling
	Fairfield, F. E., Williams	1	2, 30-21		Rigging up
	Trico Oil & Gas Co., Westco	2	34, 30-22		Rig
Midway	Baker, Leyse & Sonne	1	20, 32-23	2730	Idle
Mt. Poso	G. & V. Oils., Ltd.	1A	35, 26-28	915	Drilling
	The Caminol Co.	1	24, 26-27	227	Drilling
Panorama Hills	Burrhuf, V. E.	2	31, 31,22		Rig
Richgrove	Crusaders Pet. Corp., Quinn	1	9, 25-27	1475	Cleaning out
	Dilamar Oil Corp., Quinn	3	15, 25-27	2902	Idle
San Emigdio	Continental Oil Co.	KCL F-1	5, 10-21	9227	Testing
	Shell Oil Co.	KCL 2A 52-13	13, 11-22	11794	Drilling
	Shell Oil Co., Pleito	A-37-25	25, 11-21	2647	Drilling
Shale Hills	Gamble & Oliver, Abbott	1	7, 27-19	1107	Drilling
	The Texas Co., McD-Theta	1	12, 28-19		Rigging up
Strand	Continental Oil Co.	KCL D-2	14, 30-36	14051	Testing
	Kings County				
Reef Ridge	Chuka Oil Co.	2A	10, 23-16	161	Drilling
Strattford	P. W. Burnham & Assoc., Bartells	1	23, 20-20		Rig
	Tulare County				
Pixley	Compass Oil Co.	1	8, 23-26	3300	Drilling
	Trico Oil & Gas Co., Tulare Farms	1	27, 24-23		Rig

Strand Deep Well Fishing Drill Pipe

Continental Oil Co.'s KCL No. D-2, third deepest drilled hole in the world, encountered trouble while preparing to test the Olcese zone from a plugged depth of 11,802 ft. The hole was drilled to 14,051 ft. encountering showings below 11,600 ft. A drillable liner was cemented at 11,802 ft. for the test, but while cleaning out, the drill pipe struck at 11,746 ft. Unable to loosen, the company at last report had cut and recovered the pipe to 2700 ft. and was fishing the remainder.

General Pet. Contributes Large Greeley Extension

Another major oil discovery in the valley was certified when General Petroleum Corp.'s Sullivan No. 1 flowed clean oil at an undertermined rate on a water shut off test of 6⅝ in. casing cemented at 11,325 ft. Located near the east quarter corner of sec. 12,29-25, a little more than a mile northwest of Greeley production, the strike was tested with bottom at 11,386 ft. after topping the Rio Bravo oil sands at 11,320 ft. With a ⅜ in. bottom hole bean and a 5000 ft. water cushion, clean oil reached the surfact in 25 minutes. The oil was permitted to flow under a 600 lb. surface flow pressure for only three minutes when the well was killed to permit drilling ahead. When last reported bottom was at 11,436 ft. in Vedder oil sand.

Indicative that the strike may be a direct connection to the Greeley Field is the fact that the productive zone was found five feet higher than in the nearest field producer. While the Sullivan well is also near the Rio Bravo Field, and producing comparable zones, connection between the two is discounted by the fact that southerly Rio Bravo wells are considerably lower on structure and are known to be separated from the strike by a barren area, such area being demonstrated by the recent abandonment of Superior Oil Co.'s 14,018 ft. Helbing No. 1 at the southeast limits of the Rio Bravo field.

General Petroleum has poured foundation for Farrand No. 1 one location northwest of the hit. While the discovery will probably stimulate drilling among the several operators holding acreage near the well, Standard Oil Co. is the only operator at present engaged in drilling on the structure. Standard's well, KCL No. 12-5 located 2000 ft. southeast of the find in sec. 7, 29-26, was last reported drilling at 10,861 ft. Standard has also announced location for KCL No. 12-7 near the southwest corner of section 7.

Compass Drills Pixley Wildcat

Compass Oil Co. is drilling well No. 1 in the comparatively little drilled Pixley Area. Located in sec. 8,23-26, six miles east and two miles south of the town of Pixley, the try at last report had reached 3300 ft. and had marked the presence of a little sand showing gas at 1410 ft.

Only other tests of the area are two wells which encountered the slate basement at 4000 ft.

B. V. Lake Drillers Near Stevens Zone

The three wildcats located in and near the limits of the Buena Vista Lake bed, are drilling near the point at which the Stevens zone may be expected. The zone has been found in the east end of this area in both productive and unproductive status near the 10,000 ft. level.

Richfield Oil Corp.'s BVA No. 81-36,

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located in sec. 9,32-25 at the northwesterly tip of the Buena Vista Gas Field, has already demonstrated commercial gas production from the Etchegoin at 5500 ft. and was last reported at 10,213 ft. in the quest for Stevens zone oil production.

At the south edge of the lake Shell Oil Co.'s BVA No. 45-9, in sec. 9,32-25, has reached 9672 ft. As expected, nothing has been found at this point.

The third wildcat in the district, General Petroleum Corp.'s BVA No. 1, located in sec. 1,32-24 on the flank of the Buena Vista Hills, was last reported at 10,477 ft. Located some 9 miles west of the Stevens zone production at Paloma, engineers expected to pick up the zone some 2000 ft. higher than the present bottom. As the Cherty shale usually overlying the Stevens has not yet been encountered and the fact that the bugs indicate the close proximity of the zone, encourages the hope that the potential oil producing sands will yet be entered.

San Emigdio "Cat" Preparing To Test

Continental Oil Co.'s KCL No. F-1, located in the hills south of the San Emigdio plains on sec. 5,10-21, is running drillable liner for a test of the hole bottomed at 9227 ft. With 8⅝ in. casing cemented at 8660 ft., the test will be made of showings encountered at intervals from 8670 ft.

North of the hills Shell Oil Co.'s Pleito No. A-37-25, sec. 25,11-21, is drilling below 2647 ft. Shell Oil Co.'s other San Emigdio try, KCL No. 2A-52-13 located in sec. 13,11-22, was last reported at 11,794 ft. in hard shale. This well, with a 10,297 ft. protective string in place, to date has reported nothing of significance.

Rio Bravo Well Tops New High

Superior Oil Co.'s Weber No. 1, most northwesterly of the Rio Bravo wells, encountered the top of the oil sand at 11,177 ft. to establish the well as the highest on the prolific structure. With bottom in oil sand at 11,197 ft. a water shut off test is being made on 7⅝ in. pipe cemented at 11,174 ft. Superior's other current driller, Smith No. 1 located near the center of sec. 34,28-25, is below 9800 ft.

Union Oil Co.'s Kernco No. 41-34, lolated on top the structure near the north quarter corner of section 34, and last reported at 11,175 ft., is expected to enter the Rio Bravo oil sand at any moment.

Texaco To Test W. of Belridge

The Texas Co. is building rig for McDonald-Theta No. 1, near the center of sec. 12,28-19. The test, southeast of Shale Hills and five miles southwest of the North Belridge Field, will be the first drilled in the area since 1935, when Continental Oil bottomed Maylan No. 1 at 5304 ft. and R. E. Bering drilled Maylan No. 2 to 1067 ft.

El Tejon Oil & Ref. To Test Edison Area

El Tejon Oil & Refining Co. is preparing to spud Douglas No. 1 in sec. 32,29-29. The location, three miles northwest of the main body of the Edison Field, was made six months ago by Francis O'Reilly and is near Petrex, Inc.'s Metro No. 2 which was recently completed pumping 153 bbl. rate from 4206 ft.

Burt & Taylor Spud McKittrick Test

A. G. Burt & W. J. Taylor have spudded Taylor No. 1, in sec. 30,30-22, one and a half miles south of McKittrick Field limits. Surface casing is standing cemented at 300 ft. in the hole which was originally started by O. T. Deal under the well name of Rankin No. 1.

At the north extremity of the field F. E. Fairfield is preparing to spud Williams No. 1 near the north quarter corner of sec. 2,30-21. Two miles southeast of the southerly tip of the field, Trico Oil & Gas Co. has rig up for Westco No. 2, a test of sec. 34, 30-22.

Caminol To Drill Mt. Poso Wildcat

The Caminol Co. is rigging up well No. 1, near the east quarter corner of sec. 24,26-27, for a test of the undrilled section lying two miles west of the Dominion Pool.

Two miles southeast of the Pool, near the southeast corner of sec. 35,26-28, G. & V. Oils, Ltd. is coring Hill No. 1A ahead in gray silt at 912 ft.

Burrhuf To Drill Panorama Hills

V. E. Burrhuf has erected a rig to drill well No. 2 in the northwest quarter of sec. 31-31-22. Located in the Panorama Hills, three miles southwest of the Midway Field in Kern County, the try will be the first new development in the immediate area since 1929, at which time Geo. F. Getty bottomed Phelps No. 1

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in vertical dips at 3493 ft., a little more than a mile northeast of the current project.

In the Elkhorn-Carriza area of San Luis Obispo County, which is adjacent to the Panorama Hills, S. M. Newton is fishing cable tools in Stafford No. 1. The well, bottomed at 5075 ft., has been drilling in sec. 18,31-21 since February of this year.

Todd Pettigrew & Associates have erected a rig in sec. 8,32-22 for a test of one of six structures said to exist on the 19,000 acres held in this area by an Eastern Syndicate.

Robt. A. Foster is preparing to abandon McKee No. 1 in sec. 2,32-22. Bottomed at an unproductive depth of 5075 ft, and plugged back to pump from 2800 ft., the well produced only 40 bbls. water with 1 bbl. of oil daily.

Wilshire Annex Swabs—No Kick

Failing to flow after more than thirty-six hours of continuous swabbing, Wilshire Annex Co.'s outpost driller in the Coalinga Area, Well No. 64-30B, proved a little disappointing. The 8383 ft. hole, located near the center of sec. 30,19-16, has a water string cemented at 8355 ft. and 5¾ in. liner with the bottom 10 ft. perforated landed at 8372 ft. At the last report the fluid level was standing at 2800 ft.

Located between the Coalinga northeast area and the Coalinga Eocene Pool, the well is being carefully watched as an index to the probable productive area of each shore line deposit. Top of the productive sand was found 357 ft. lower on structure than in Standard Oil Co.'s 73-19B, most southerly of the Northeast area's producers, and 1606 ft. lower than in Superior Oil Co.'s Cagle No. 3, most northerly producer in the Eocene Pool. The apparent thinning of the oil sands, plus the position on structure, would indicate that the well is a southerly outpost of the Coalinga Northeast area rather than an addition to the Eocene Pool.

In the main northwest body, Amerada Petroleum Corp. is in brown shale at 7387 ft. after locating the top of the Kreyenhagen at 7115 ft.

Bandini Petroleum has erected a rig for its proposed well No. 46-18 in sec. 18,19-16. Standard Oil Co.'s 51-19B, in section 19, encountered the Kreyenhagen at 6580 ft. and was last reported at 6672 ft. The company has also announced location for 62-19B in section 19.

Union Oil Co.'s Cook 75-18, located in section 18, is drilling at 1793 ft., while No. 57-18 encountered the Kreyenhagen at 6424 ft. and at last report was drilling at 6890 ft.

Superior Oil Co., operating in sec. 18,19-16, was last reported in brown shale at 7574 ft.

Marysville Well Cores Cretaceous

Buttes Oldfields, Inc., is drilling its sixth Marysville Buttes gas well in Cretaceous gray shale below 5707 ft., according to reports recently received by President O. G. Green from G. I. McBride, resident engineer. Known as McPherrin No. 1, the new project seeks the heavy gas production developed in the company's previous wells.

Fueling Method Boosts Pay Load

Bigger payloads with greater safety are assured trans-Atlantic mail planes with the development of the flying tanker for refueling in mid-air at the rate of 1,000 gallons in 10 minutes.

Aerial refueling will add 7,000 pounds to the payload, it is estimated, by enabling planes to take off with a reasonable fuel load which can be increased in the air. A plane taking off at a weight of 46,000 lbs. can, by means of this system, have its weight increased to 53,000 lbs. before it starts its ocean crossing.

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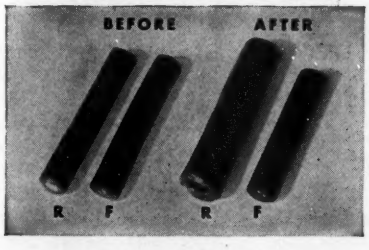

Oil causes rubber to swell, does not affect Flamenol

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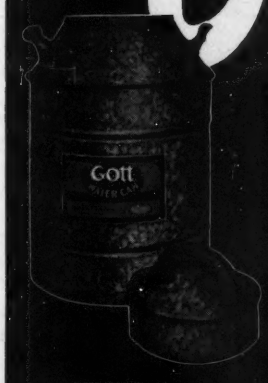

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Los Angeles Basin

Wilmington Well Gets 5400 Bbl. Potential

Again demonstrating that Wilmington is one of the world's greatest oil fields, Union Pacific Railroad brought in No. 120 with an umpire's potential rating of 5400 bbls. daily. The big well is located on the north bank of the connecting channel east of the Ford assembly plant and produces both Terminal zones.

Less spectacular but more important was the coring of Ranger Zone oil sand from 3285 to 3415 ft. in Simon Bernstein's northeast outpost on Wilmington Blvd. west of Pico. Preparations are being made for a production test after cementing an 8⅝ in. water string. Half a dozen other operators are ready to start work immediately if a commercial well is obtained. In the Santa Fe Ave. section, Dumm Bros. are completing No. 3 and have staked a location for No. 4. J. M. Jackson Exploration Co. plans to drill Workman No. 1 on Wilmington Blvd. near Canal St. at once.

Roy Morgan's Ruth No. 1, located north of Anaheim near Hayes St., is flowing 75 bbls. a day of 15 gravity clean oil from 150 ft. of zone open to 3350 ft. A 10/64 in. bean holds a flow pressure of 75 lbs.

Royalty Service Corp. is continuing its reconditioning and deepening program by rigging up Lakme No. 1 and Santa Fe No. A-3. Latest completions were Packard No. 3 pumping 225 bbls. from the Ford Zone and well No. 16-7-1 flowing 300 bbls., from the Ranger and Upper Terminal horizons. The company is drilling Nelson No. B-7 below 2700 ft.

At present writing, Long Beach Oil Development Co. is without a single drilling well, two being in the process of completion, one undergoing repair work and two in preliminary stages.

After failing to find production in the Ford one, Brookline Oil Co. plugged Nix Comm. No. 1 from 5784 ft. to 3664 ft., where, with 600 ft. open, production is 125 bbls. a day. Brookline is preparing to drill Donnie No 1, a new well, at "L" St. and Marine. Nix Comm. No. 1 is on the northeast corner of Denni and Eubank in the northerly townlot area.

Montebello Ninth Zone Speculation Runs High

With the Eighth Zone virtually outlined except in the extreme westerly portion, Montebello operators are seriously speculating on the advisability of drilling for the Ninth Zone which is believed to underlie present productive horizons.

Belief in the existence of a deeper productive sand is founded on the logs of two wells which found it barren in off-structure locations. Several years ago, Standard Oil Co. drilled to 9334 ft. in Baldwin No. 82, located north of the deep structure. All of the sand members known as numbered zones within the proved area were found and are definitely indicated on the electric log, the Eighth zone equivalent being noted at the sub-sea depth of 7580 ft., nearly 300 ft. lower than any well now producing and below the water table of the horizon. Below this zone, the electric log indicates another sandy interval of sufficient porosity to be an oil reservoir in a favorable structural position.

The case of the as yet hypothetical Ninth Zone is also strengthened by Union Oil Co.'s La Merced No. 30 which plugged from 8668 ft. to become the discovery well of the Eighth Zone. Located on the 7265 ft. subsea contour, the well is very close to the edge of commercial Eighth Zone production and, it is said, found no other sands capable of a paying yield. The log of the well is reported to have indicated another zone similar to that found by Standard. Whether or not it contained oil is the subject of much discussion, many field men being of the opinion that the sand was good but that Union did not deem it wise to open it at the time. Union officials refuse to comment. Regardless of the sand's productivity at this location, engineers point out that each succeeding deeper zone has been slightly south of those above, therefore it would not be surprising to find a new horizon, fully as extensive as the Eighth, but whose crest is enough to the south so that its edge did not reach the location of La Merced No. 30.

At any rate, hopes are high and enthusiasm is getting to the point where some one will soon hoist the banner "Ninth zone or Bust."

Drilling activity increased slightly to 40 projects actually making hole, the vast majority of which are independently owned. Only seven wells were completed during the past two weeks but 20 are either drilling below 7000 ft. or are now completing, indicating a much higher total for the next period.

Average drilling time for Eighth Zone wells has dropped sharply since the first few required 60 or more days while pres-

LOS ANGELES BASIN WILDCATS

Area	Well	No.	Section	Depth	Status
Athens	Melrose Pet. Co.	1	12, 3-14		Foundation
Chatsworth	Fernando Oils, Ltd., Holmes	1	18, 2-16		Grade
Dominguez	R. E. Havenstrite, Operator	1	32, 3-13	3937	Drilling
Inglewood	Vanguard Oil Co., L.A.I.	1	29, 2-14		Rig
Mint Canyon	Redwood Oil Co., Mitchell	2	22, 4-15	525	Idle
Newhall	Mangrum and Page, Lintz	1	4, 3-15	641	Drilling
	Consolidated Pet. Co., Needham	4	13, 3-16	3635	Fishing
	Tamas Oil Co., Perkins	1	11, 3-16	2597	Drilling
Palos Verdes	Rolling Hills Pet.	1	27, 4-14	6520	Drilling
Potrero Heights	Owen O Oil Co.	1	36, 1-12		Cellar
Puente	Kelso, F. W., Kelso	1	13, 2-10	2380	Idle
	Stabeck & Assoc.	1	14, 2-10		Rig
Sunland	Casa Grande Oil Co.,Lopez-Lundy	1	1, 2-15	2140	Stdg. cem.
Whittier	C. W. Partridge, Hillside	1	22, 2-11	1780	Idle
	Partridge, C. W., Whittier Crude	14	22, 2-11	1310	Rig. pump
	Orange County				
Costa Mesa	Thompson, Milton N. Banning	1	9, 6-10	25	Drilling
Olive	Morton & Elder	1	17, 4-9	628	Pumping water
	San Bernardino				
Carbon Canyon	Carbon Canyon Oil Co.	1	30, 2-8	256	Idle
	Hokom, John Oil & Gas Co., Ltd., Hokom	1	31, 2-8	2941	Idle

NORTHERN COUNTY WILDCATS

County	Well	No.	Section	Depth	Status
Contra Costa	Tassajara Oil Corp.	1	9, 2s-1e		Rigging up
Merced	Seaboard-TWA-Union, Howard	1	6, 8s-11e	4210	Drilling
Monterey	Priest Valley Pet. Co., Greve	1	22, 20s-12e	1190	Drilling
Sacramento	The Texas Co., Welsh	1	5, 3n-3e	3383	Drilling
San Benito	Consolidated Pet. Co.	1	11, 17s-11e	2007	Idle
Santa Clara	Wright, C. W., Beatty	1	27, 8s-2w		No report
Sutter	Buttes Oilfields, Inc., McPherrin	1	1, 15n-1e	5707	Drilling

ent completions are sometimes in as low as 40 days.

The finding of good oil sand at 7500 ft. in The Texas Co.'s westerly outpost, Wilcox No. 1, assures farther extension of production in that direction and the company has foundations in for No. 2 located 850 ft. to the west.

Production of West Montebello deep wells, most of which is from the 85 flowing the Eighth zone, averages slightly more than 20,000 bbls. daily.

Interest High In Signal Hill

With one well testing casing prior to farther penetrating the deep zone, another drilling near the 9500 ft. level and a third well on the way, Signal Hill is again the most important spot in the California oil picture.

Nearest to the 10,000 ft. production goal is Dormax Oil Co.'s No. 1, being drilled by R. W. Jerman, who last year discovered the deep sands in his De Soto No. 1. Although detailed information is temporarily being withheld, the well is believed to be approximately 9700 ft. deep and to have 7 in. casing cemented at 9500 ft. When an "OK" is received from the State Division of Oil & Gas, the hole will be cleaned out to bottom and cored ahead a distance of several hundred feet before attempting a production test. Located at the corner of 25th St. and Gaviota, the Dormax well is considered to have a favorable structural position.

Now sharing deep honors with the Jerman enterprises, Jack Rogers' El Hondo No. 1 is drilling near the 9500 ft. level. Only a little farther from the Cherry Hill fault than De Soto No. 1, El Hondo seems a safe bet to make some sort of a well. Co-incidentally, Jack Rogers and Rocky Jerman have been buddies for nearly 20 years, drilling on the same rigs, pushing tools together and now drilling deep wells in competition with each other.

Third deep well now drilling is Allied Petroleum Corp.'s No. 34 which is a westerly offset to De Soto No. 1. Having recently spudded in, bottom of the hole is yet above 2000 ft.

Just south of the crest of Cherry Ave. hill, Tom Bailes is planning to drill a deep well on property of Southern California Drilling Co.

Biggest Signal Hill deal in recent years was that recently completed by John McKeon when he acquired the right to bottom 20 wells beneath the cemetery at depths above 3500 ft. and greater than 7000 ft. Derrick has been built over the abandoned Rawco No. 1 which will be redrilled from below the surface casing and whipstocked northerly. The well, called Oil Exchange No. 1, is located on Lewis Ave., half a block south of Willow and will be completed in the shallow zone. Location notices have been filed for three more wells.

On the Union Pacific right of way forming the west boundary of the cemetery, Atlantic Oil Co. finished No. 12 in the Alamitos zone with 90 ft. of hole open to 3238 ft. pumping 170 bbls. of 23 gravity oil. Water content is reported as 10.0%. The unexpected high yield inspired the company to start No. 13 approximately 250 ft. to the south.

The northwest extension area, inactive for some time save for deepening jobs, is soon to have a new well at its farthest extremity where The Caminol Co. is preparing to drill Dominguez No. 3-19. A. A. MacDonald and Signal Oil Co. are deepening their P.E. No. 1 to the second horizon from which Hilldon Oil's Amebco No. 3 is pumping 125 bbls. of clean oil.

Other new wells to be drilled immediately are Sid Johnston's No. 39 at American and Pepper Drive and The Texas Co.'s Bauman No. 6 at 29th and Gundry.

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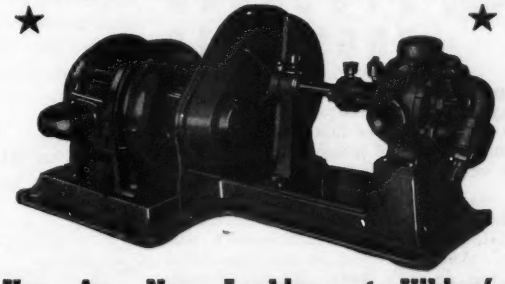

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Step-Up Is Noted In Rosecrans Work

Recent completion of Darling Comm. No. 1 by the joint operators, Barnsdall Oil Co. and Wilshire Oil Co., has resulted in a marked step-up in Rosecrans development work. With the southeasterly outpost flowing 383 bbls. of 31 gravity oil a day and about 300 bbls. of water, the operators moved one location to the east where they are drilling Santa Fe No. 1.

Believing that the deep zone will extend to the west, Dr. Geo. G. Averill is deepening his No. 3 which failed to find anything worth a test to 7846 ft. and was abandoned. According to engineers, this well is several hundred feet lower than Darling Comm. No. 1 and should therefore encounter the horizon near the 9000 ft. level.

Thomas Kelly & Sons are planning to start the first of three wells to be drilled at the southeast corner of Compton Blvd. and Ball St. south of Southern California Petroleum Co.'s Slabaugh No. 1. The latter well is somewhat of a mystery, production estimates ranging from 150 to 600 bbls. a day. In any case, it is the best producer in the area.

Pushing field limits still farther south in the Broadway section of the field, John Woodward's St. Anthony Oil Co. is rigging up the first of three wells which will offset Union Oil Co. and Royalty Service Corp. holes.

At the north end of its Trust lease, Universal Consolidated Oil Co. is drilling No. 18 in shale and oil sand at 6000 ft. after reporting the top of the Zinns zone at 5911 ft.

For its deep test northwest of Athens, Melrose Petroleum Co. has foundations completed and will build the derrick at once. Thorley Oil Co. plans to start its deep test in two weeks.

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Penguin ReDrills Torrance Duster

Penguin Oil Co. is redrilling the abandoned J. E. O'Donnell No. 73 most southerly well in the Torrance Extension area. The 5270 ft. hole was plugged nearly to the surface and is being whipstocked to the northwest.

Casa Grande Stands Cemented

Casa Grande Oil Co.'s Lopez-Lundy No. 1, which cored several feet of oil sand to bottom at 2140 ft., is standing with 8⅝ in. casing cemented at 2100 ft. The project is located in Lopez canyon near San Fernando.

Petromont Pumps No. 2 at 5 Points

Delayed by the necessity of recementing the 7 in. water string at 4410 ft., Petromont Oil Co. is only now putting Burton No. 2 on the beam. With the hole finished at 4470 ft., the well is expected to equal the steady 100 bbl. rate of its neighbors.

Across the street north of Petromont, Mrs. Orr is making slow time with her W. D. Owen, Montgomery No. 1. Last reported bottom was at 3800 ft.

In the old field Alabama Street Oil Co. is drilling at 2700 ft .and Ray Price is preparing to deepen an old hole.

T. W. A. Finishes Aliso Canyon Well

Tide Water Associated Oil Co. brought in another nice well in the Aliso Canyon with the completion of Fernando No. 11. Bottomed at 5175 ft. and with 8⅝ in. casing cemented at 4799 ft., production is 413 bbls. a day of 20 gravity oil.

Porter No. 12 will be the company's next producer, it having just cemented its water string at 4721 ft. Porter No. 3 is preparing to spud in.

Coyote Outpost Pumps 100 Bbls.

Pumping 100 bbls. of oil and 180 bbls. of water, Sonwell Oil Co. recently completed its East Coyote outpost well. The project found the lower Anaheim zone barren and plugged from 3837 to 3384 ft. where a 7 in. combination string containing 279 ft. of perforations was landed.

Bartholomae Oil Corp. is deepening Stern No. 1 from its old bottom of 3950 ft. and Union Oil Co. is preparing to complete Hole No. 21 after setting casing at 3802 ft. Bottom is 4673 ft.

Cavins Branch Manager Moved to Mid-Continent

Paul Cavins, president of The Cavins Co. of Long Beach, Calif., announces the transfer recently of Len Moon from California to the Mid-Continent district.

Mr. Moon has been manager of the company's branch at Taft, Calif. for a number of years. His new duties will be to assist the various branch managers throughout the Mid-Continent fields in whatever manner possible, serving in an advisory capacity; and to acquaint the personnel of these branches with new products added to the Cavins line of equipment which are to be introduced in the near future. For the present he will not be permanently located at any one point, but after spending several weeks with Mr. Trewitt of the Odessa branch, expects to apportion his time about equally between four of the company's principal branches—Houston, Corpus Christi and Odessa, Texas and Ada, Okla.

Validity of the statute regulating the spacing of California oil and gas wells has been upheld at San Francisco in a District Court of Appeals opinion denying a writ of mandate.

A single gallon of gasoline will keep a new 10-lb. outboard motor running at full speed for 10 hours.

Coastal District

Goleta Gas Well Awaits Drilling Crew

General Petroleum Corp. is awaiting the release of a drilling crew before spudding No. 5, its newest well on the large More Ranch at Goleta. The derrick was erected in sec. 22,4-28 several weeks ago.

Savage Tests Calumet No. 2

After redrilling and deepening Calumet No. 2 to 2985 ft., Savage Oil Co. landed a 5 in. liner on bottom and is testing for production. It was necessary to cement off perforations at 1050 ft. in the old 8¼ in. casing before the new zone below 2600 ft. could be tried.

The Calumet property is located in sec. 3,3-19 and forms a portion of the Shiells Canyon field.

Camden Oil Drills At South Mountain

Camden Oil Co., recently formed by Harry Rilling, is drilling the only active well in the South Mountain area. When last reported, the project was below 1520 ft. and had encountered a soft gray sand spotted with oil. Located in sec. 13,3-21, the well seeks a westerly extension of the field.

Section 20 Tests Tar Creek Wildcat

Section 20 Oil Co. which for several years has been drilling a wildcat well in the Tar Creek area of Ventura county, is making another production test of Eocene oil sands. A combination string of 6⅝ in. and 4¼ in. casing including 250 ft. of perforated on bottom, was landed at 4100 ft. and cemented at 3850 ft. A previous test with formations open from 3650 to bottom at 4157 ft. resulted in the recovery of water with a little oil. The well stands in sec. 20,5-19.

Lomas, Union Finish Santa Maria Gushers

Both independents and majors were represented in recent large completions in the southwest end of the Santa Maria Valley field. Greatest yield was recorded for E. H. Lomas' Reg No. 1, which, finished at 5601 ft. with 350 ft. open, flowed initially 3990 bbls. a day, later building up to a 4800 bbl. rate. . Gravity of the oil is reported as 15.5 degrees, exceptionally good for Santa Maria.

With 312 ft. open to bottom at 5350 ft., Union Oil Co. completed its O'Donnell No. 2-3 gauging 3410 bbls. a day of 14.8 gravity clean oil through a 64/64 in. bean under 250 lbs. flow pressure. Beaned back to 44/64 in., the flow registered 2220 bbls. of oil and 575,000 cu. ft. of gas.

Both wells are located in the O'Donnell Subdivision, once the property of the famed Polish pianist Ignace Paderewski.

In the same area as the new gushers, Navy Oil Co. has spudded in the northeast corner of lot 28.

Union Oil Co. is nearing final bottom in Vicente No. 6 in sec. 21,10-34, the last reported depth being 4660 ft.

W. R. Gerard is drilling Gerard-Breneiser No. 2 below 4700 ft. after topping the Miocene at 4475 ft. The well is located in the "Hot Spot" of two years ago in sec. 27,10-34.

Fred E. Cole of Santa Barbara has announced plans for drilling Paderewski No. 3 adjoining the Lomas completion.

C. C. M. O. Drills Rincon Wells

Near the easterly end of the Rincon field, C. C. M. O. Co., oil operating unit of the Santa Fe Railroad system, is drilling Hobson No. B-28 in gray sand below 3820 ft. At the north edge of production, the company is preparing to resume the drilling of No. B-10A which was suspended several years ago at 695 ft.

General Petroleum Corp. is grading roads to Hobson No. A-8 in Padre Canyon.

Continental Oil Co. is testing Grubb No. 12 at San Miguelito after cementing 7 in. casing at 6005 ft. No. 14 is drilling below 2500 ft.

Argo to Drill Ojai Wildcat

Frank W. Argo of Santa Paula is said to have let the contract for a rig for his proposed wildcat on the McGregor property in sec. 7,4-21 near Ojai.

Sespe Well Pumps 25 Bbls. Per Week

The Sespe well drilled by Dr. Speik in sec. 33,5-19 is reported as being pumped once a week for three hours recovering 25 bbls. of clean oil. The well produces a 300 ft. interval open to bottom at 3960 ft.

Ventura Outpost Flows 220 Bbl. Rate

After flowing initially a few heads at a rate of 500 bbls. a day, California-Alliance Petroleum Corp.'s Hartman Ranch No. 1 settled to a rate of 220 bbls. of 30 gravity clean oil through a 16/64 in. bean. At the end of two weeks, production had dropped to 154 bbls. and the last report was to the effect that further work would be done on the well to increase its yield.

Tide Water Associated Oil Co. recompleted Lloyd No. 66, an old well, at 6434 ft. flowing 215 bbls. a day cutting 5.0% after bringing in on the gas lift.

On the north side near the California-

COASTAL COUNTIES WILDCATS

Area	Well	No.	Section	Depth	Status
Santa Barbara County					
Carpinteria	Sunset Oil Co.	1	32, 4-25	3413	Idle
Cuyama	Hearte, O. K.	1	11, 9-25	600	Idle
Goleta	Gen. Pet. Corp., More	5	22, 4-28		Rig
Lompoc	Sun-Bell Drilling Co.	1	28, 8-34	2982	Idle
Los Olivos	United Western Oil Co.	1	15, 7-30	3935	Rep. equip.
San Luis Obispo County					
Elk Horn	Calif. Pet. Prod., Irons	1	19, 10-24	2495	Drilling
	Newton, S. M., Stafford	1	18, 31-21	5075	Fishing
	Newton, S. M., Well	1	3, 32-21		Grade
	Todd Pettigrew & Assoc.	1	8, 32-22		Rig
Midway	Foster, Robt., A., McKee	1	2, 32-22	5075	Abandoning
Paso Robles	Epco, Inc.	1	27, 26-13	6146	Idle
Ventura County					
Conejo	Sulphur Springs Oil Co., Janss	1	33, 2-19		Rig
Ojai	Argo & Rynning, M & A	1	7, 4-21		Location
Santa Susana	K. C. Oil Co., Marr	1	32, 3-17	1014	Idle
Sespe	Nevada-Fortuna Oil Co.	1	13, 4-19		Rig
	Renard Oil Co.	1	6, 4-19	720	Drilling
Shiells Canyon	Galveston Oil Co.	1	5, 3-19	3140	Fishing
South Mountain	Rilling, Harry	1	13, 3-21	1520	Drilling
Tar Creek	Section 20 Oil Co.	1	20, 5-19	4157	Testing

Alliance well, British-American Oil Producing Co. is drilling Hartman No .9 below 3540 ft. and Tide Water Associated is preparing to deepen Hartman No. 20 from present bottom of 5407 ft. Shell Oil Co. is testing Taylor No. 107 after cementing 7 in. casing at 4620 ft. with 500 sacks.

General Motors Officials On Pacific Coast Visit

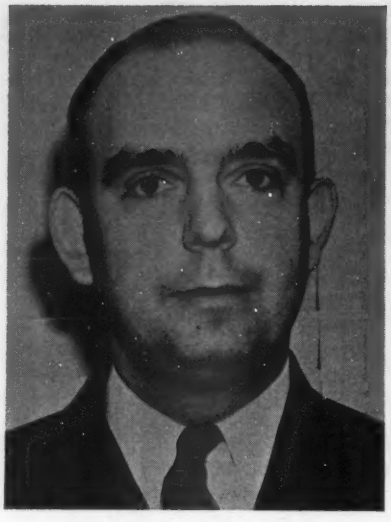
The Diesel Engine Division of the General Motors Sales Corp., Cleveland, Ohio, practically moved its executive staff into Southern California last week on the occasion of the visit to Los Angeles, on a coast-wide business trip, of Max H. Schachner, sales manager of the Diesel Engine Division, Volney Fowler, advertising manager of the General Engines Division, and E. D. Longenecker, Pacific Coast regional supervisor of the Diesel Engine Division. While in Los Angeles they inspected the facilities of the Beeson Engineering Co., distributors in Southern California, Arizona and Southern Nevada of the General Motors "Packaged Power" Diesel engines.

Mr. Schachner, one of the pioneers in the development of the modern Diesel engine as compared with the crude machine first built by Rudolph Diesel in 1892, played an important part in the perfection of the General Motors two cycle "Packaged Power" Diesel units which are patterned after the remarkable Diesel engines built by General Motors to power some of the finest streamlined trains in the United States.

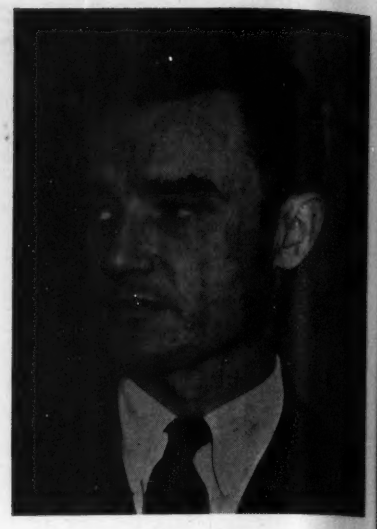
Predicting a widespread use of the compact and powerful Diesel engine in many diversified lines of industrial activity, Mr. Schachner is authority for the statement that these engines convert several times as much of the energy of a fuel into work as does the steam engine or steam turbine and are even much superior to the most highly developed gasoline engines.

"The unusual performance of the Diesel engine and its high economy factor are resulting in conversions from other types of power in countless lines of industrial activity," said Mr. Schachner.

"The Pacific Coast territory, with its many important major industries, offers an almost limitless market for the Diesel engine—and particularly is this true in the truck replacement field. The many major motorized freight lines operating in Southern California and rolling up thousands of miles per unit per month, offer a market where the Diesel engine is almost a necessity if operating costs are to be kept at a level that will insure profitable operation," continued Mr. Schachner. "I am glad to say that General Motors Diesels are operating satisfactorily in the fleets of many of these large scale operators and their performance has been such that we anticipate a healthy increase in the number of engines that will be shipped to the Pacific Coast next season for truck replacement purposes.



Max H. Schachner



Volney Fowler

Lane-Wells Officials Complete Inspection Tour

The outlook for drilling and production is generally optimistic for 1940, according to a statement issued by Rodney S. Durkee, president of Lane-Wells Co. Mr. Durkee, accompanied by M. E. Montrose, general sales manager of the organization, has just completed an inspection tour of the company's branches in the Mid-Continent and Gulf areas and in the East and Canada. Conditions in all parts of the country were found to be satisfactory with indication of increased activity in most of the fields.

Lane-Wells Co. is planning during the coming year to complete several new field units for Gun Perforator and Electrologging services, two of the organization's major activities. Increased demand by operators in all fields for Lane-Wells Technical Oil Field Services will keep the Los Angeles plant at capacity operation producing needed trucks and equipment during the coming year.

Baroid Mud Balance For Determining Density

The new Baroid Mud Balance affords a simplified means of determining mud density right at the well, and is designed to overcome difficulties encountered with other density instruments. The balance is extremely rugged, but produces reasonably accurate results regardless of slight variations in temperature.

It consists of a graduated beam with integral cup and adjustable counterweight, a knife edge, slide, and support.

The cup and beam oscillate in a plane perpendicular to the horizontal knife edge which rests on the support, and are balanced by adjusting the slide on the beam.

The beam is graduated in pounds per square inch per 100 feet of depth and pounds per gallon or pounds per cubic foot. The position of the slide on the beam when in balance indicates the density of the mud in the cup.

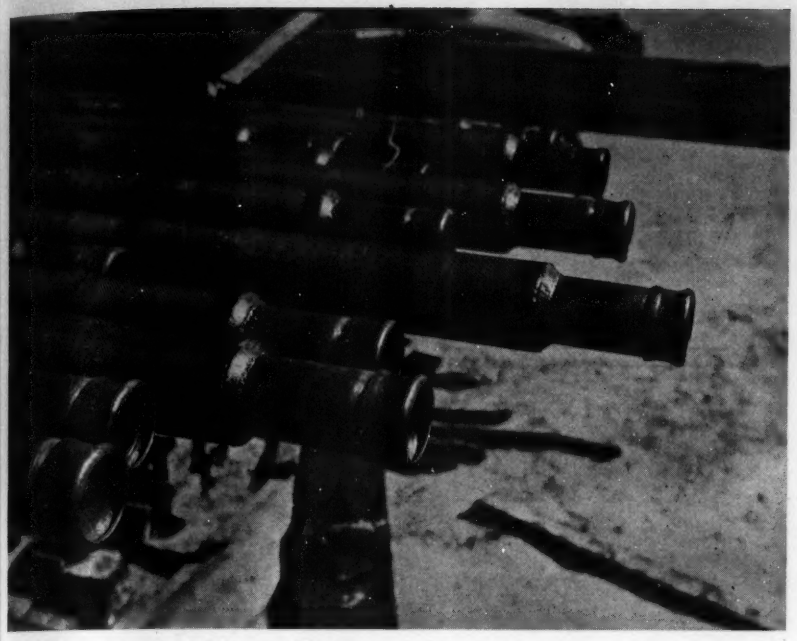
The Baroid Mud Balance is constructed in compliance with A.P.I. specifications on equipment for the field testing of drilling mud.

Further details on the Balance concerning construction, operation, or price can be obtained by writing the Baroid Sales Department office at Los Angeles, Houston, or Tulsa.

Lunkenheimer Catalogue 78

The Lunkenheimer Co., Cincinnati, Ohio, has just issued its Catalogue 78, which illustrates, describes and lists the complete line of bronze, iron and steel valves; boiler mountings; lubricating devices; oil and grease cups, whistles, cocks, fittings, etc., manufactured by the company.

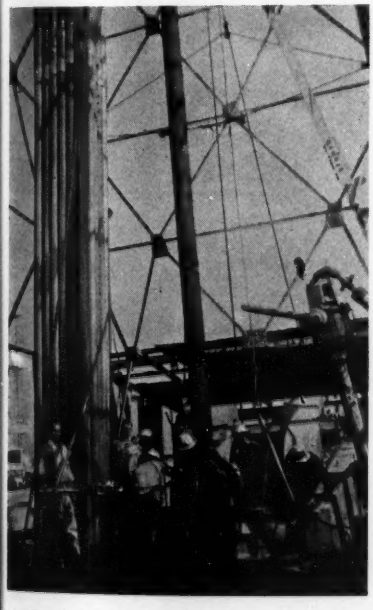
You are reading the Pacific Coast oil men's home paper.



J. B. Nelson Co. pre-packed gravel liner on rack of Royalty service well in Wilmington.

Prepacked Gravel Liners Shop Made By Nelson

Introduced but eight months ago by J. B. Nelson, well known authority on gravel packing of wells inclined to make sand, prepacked gravel liners have met instantaneous approval and success among production men.



Running pre-packed gravel liner.

Simply made, easy to run and requiring no maintenance, the prepacked liner prevents entrance of sand into a well, and increases the natural flow of oil by relief of the high hydrostatic head in the casing.

The liners, specifically designed to meet the requirements of each application, are not confined to new installations but may be run inside of conventional liners which have been "cut out" by high velocity passage of sand and oil through the perforations.

Using a specially fabricated spring steel wire of a gauge filling the needs of the particular installation on order, a screen is made, the mesh of which is also determined by conditions at the well. This is shaped into cylinders and slid over regularly slotted pipe. With the bottom sections welded to the pipe, well rounded, ocean washed gravel, of a size best suited to the needs of the locality, is carefully packed between the screen and the pipe. With the ends welded, the screen has become an integral part of the pipe and is ready to meet the job for which it was designed.

The J. B. Nelson staff, located at 2906 Cherry Avenue on Signal Hill, is a carefully trained group who believe, and practice the belief, that only the finest material and workmanship is acceptable.

J. B. Nelson, a recognized production expert, has personally supervised running more than 25,000 ft. of prepacked liner in the Los Angeles Basin alone, and has afforded his clientele the advantage of his experience and knowledge concerning both the material to use and the best procedure to follow, in washing perforations for the maximum oil flow, without damaging the walls or the liner.

Dog house—clothing locker.

1939 A. S. T. M. Standards On Petroleum Products Ready

Sixty-two standardized methods of test, ten specifications and two lists of definitions and terms comprise the latest (September, 1939) edition of the compilation of A. S. T. M. Standards on Petroleum Products and Lubricants.

This volume is issued annually under the sponsorship of the Society's Committee D-2 on Petroleum Products and Lubricants. The latest edition (containing 350 pages) includes several new standards published for the first time covering carbon residue (Ramsbottom method), gum stability of gasoline, determination of tetraethyl lead in gasoline, consolidated specifications covering A. S. T. M. thermometers, and others. Each of the 74 items is given in its latest approved form, a number of changes having been incorporated during the current year.

The annual report of Committee D-2 includes discussion on gum and tetraethyl lead. A test for neutralization number of used aviation oils and proposed specifications for aviation gasoline published for information are also included.

Copies of this widely used compilation in heavy paper cover can be obtained from the American Society for Testing Materials, 260 S. Broad St., Philadelphia, at $2.00 each. Special prices are in effect for ten or more copies.

Rubber From Oil Is Superior Product

No longer is the United States dependent upon other nations for an emergency supply of rubber, industrial chemists say. Only a few months would be needed to set up machinery for making hundreds of thousands of tons of raw material for synthetic rubber from the nation's almost inexhaustible supply of petroleum and natural gas.

Germany manufactures a "buna" type rubber from alcohol for about 60¢ a pound, but the United States can duplicate it for about 30¢ using petroleum or natural gas by-products. Simplification of processes could reduce that figure even more, engineers believe.

The time is not far distant, in the opinion of leading rubber technologists, when synthetic rubber may be used almost exclusively in this country, not because of necessity, but because it is superior. At least three different formulas for synthetic rubber equal or superior to natural rubber already have been developed, and research in this field is proceeding apace.

You are reading the Pacific Coast oil men's home paper.

Business and Professional Directory

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TRinity 9705

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LOS ANGELES
CALIF.
MIchigan 8781

GERARD HENNY, Ph.D.
Consulting Geologist
417 S. Hill St. Los Angeles
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FOR SALE

1500 ft. 2½" extra-heavy drill pipe, quick change couplings. Portable rotary rig for sale. Madsen, 1569 W. 48th St., Los Angeles, Calif. 12/5-d

MAPS

Large maps of Los Angeles Basin oil fields and map showing all California oil fields. Price $15.00 each on paper and $20 each on cloth. Individual state oil and gas maps of Mid-Continent and Rocky Mountain regions. Maps show geological cross sections at base. These maps indicate wells drilling, wells producing and abandoned, with depths.
All maps revised up to date of purchase.
JAMES C. BRANSFORD
1127 Story Bldg.
Los Angeles, Calif.
Phone: TUcker 7530

Oil Men's Calendar

C.N.G.A. Meeting First Thurs. Each Month.

November

8-16—National Motor Truck Show, Navy Pier, Chicago, Ill.

13-17—American Petroleum Institute, 20th Annual Meeting, Stevens Hotel, Chicago.

13-17—Interstate Conference on Automotive Taxation, Western Division, sponsored by American Petroleum Industries Committee, Stevens Hotel, Chicago.

14—25-Year Club of Petroleum Industry, 1st Annual Meeting and Dinner, Stevens Hotel, Chicago, Ill.

December

14-15—Petroleum Electric Power Association, Texas State Hotel, Houston, Texas.

1940—January

15-19—Society of Automotive Engineers, Annual Meeting and Engineering Display, Book-Cadillac Hotel, Detroit, Mich.

February

12-15—American Institute of Mining & Metallurgical Engineers, New York.

April

8-12—American Chemical Society, Cincinnati, Ohio.

10-12—American Association of Petroleum Geologists, Chicago, Ill.

11-12—American Petroleum Institute, Eastern District, Division of Production, Columbus, Ohio.

18-19—National Petroleum Assn., 37th Semi-Annual Meeting, Cleveland Hotel, Cleveland, Ohio.

May

1-3—Petroleum Industry Electrical Assn., Dallas, Texas.

15-17—Natural Gasoline Association of America, Hotel Tulsa, Tulsa, Okla.

18-25—Int. Pet. Exposition, Tulsa.

California Crude Oil Production

Two Weeks Ended October 28, 1939

	October Daily Quota	Average Daily Production	Excess
San Joaquin Valley			
Belridge—North	12,865	11,890	*975
Belridge—South	2,143	1,139	*1,004
Buena Vista	16,948	14,299	*2,649
Canal	5,790	6,225	435
Coalinga-East(Eocene)	9,020	9,191	171
Coalinga—East-West	16,008	10,034	*5,974
Edison	2,244	2,259	15
Elk Hills	7,779	10,395	2,616
Fruitvale	6,189	5,866	*323
Greeley	2,940	2,742	*198
Kern Front	7,385	6,397	*988
Kern River	8,525	3,972	*4,553
Kettleman No. Dome	34,477	53,392	18,915
Lost Hills	4,035	3,518	*517
McKittrick	3,869	3,460	*409
Midway	37,874	36,740	*1,134
Mount Poso	10,195	10,667	472
Mountain View	9,682	9,719	37
Rio Bravo	7,480	7,586	106
Round Mt. and Coffee Canyon	8,064	8,476	412
Ten Section	8,664	8,350	*314
Wasco	1,325	1,376	51
Other Fields	5,026	5,021	*5
TOTAL	228,527	232,214	3,687
Coastal Counties			
Elwood	3,864	4,077	213
Rincon	2,442	3,872	1,430
Santa Maria	8,435	3,313	*5,122
Gato Ridge	2,674	5,802	3,128
Santa Maria Valley	18,992	8,365	*10,627
Santa Paula-Newhall	6,000	6,411	411
Ventura Avenue	30,146	36,883	6,737
Other Fields	5,380	5,234	*146
TOTAL	77,933	73,957	*3,976
Los Angeles Basin			
Alamitos-Seal Beach	7,045	6,857	*188
Brea-Olinda	8,346	5,752	*2,594
Coyote—East	3,097	2,674	*423
Coyote—West	10,192	10,077	*115
Domingues	16,444	17,660	1,216
El Segundo	2,983	2,679	*304
Huntington Beach—New and Old	23,100	26,448	3,348
Inglewood	13,058	14,619	1,561
Long Beach	41,107	43,921	2,830
Montebello	5,986	6,604	618
Montebello-West End	17,464	20,139	2,675
Playa del Rey	4,357	4,931	574
Richfield	7,487	8,044	557
Rosecrans-Athens	8,553	10,690	2,137
Santa Fe Springs	24,916	26,539	1,623
Torrance	5,479	5,495	16
Torrance "34" and "D & B"	8,513	9,673	1,160
Wilmington	80,998	86,510	5,512
Other Fields	3,470	3,860	390
TOTAL	292,595	313,178	20,583
STATE TOTAL	599,055	619,349	20,294

*—Shortage.